

Income & Cost Budgets

Summer Crops – 2020/21



A joint initiative between the

**Bureau for Food and Agricultural Policy
(BFAP)**

and the

Protein Research Foundation (PRF)

and the

**Oil & Protein Seeds Development Trust
/ Oilseeds Advisory Committee**

and

Grain South Africa

Oil & Protein Seeds Development Trust & Oilseeds Advisory Committee

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INSIGHT

October 2020

INCOME & COST BUDGETS FOR SUMMER CROPS – 2020/21 SEASON

Foreword

The Protein Research Foundation (PRF) strives to make a significant contribution to the promotion of local production of protein on a sustainable basis, in order to satisfy the growing demand for protein for animal production purposes as well as the optimal utilisation thereof, which will lead to an increase in the standard of living of all people in the Republic of South Africa. The main objectives of the Protein Research Foundation (PRF) are to replace imported protein used in animal feed with locally produced protein and to encourage the better utilisation of this protein. The objectives are promoted through research funding and technology transfer.

The collaboration between the Protein Research Foundation (PRF), Grain South Africa, the Bureau for Food and Agricultural Policy (BFAP) and many agribusinesses across South Africa's key producing regions creates the benefit to leverage upon each organisation's ground-level expertise, as well as valuable resources in the field of production systems and commodity enterprise budgets. The purpose of this report is to present regional commodity enterprise budgets for the 2020/21 summer crop season.

It is acknowledged that regional variation will occur and that enterprise budgets will differ from farm to farm. Whilst every care has been taken in preparing this report, it is advised to adjust the estimates according to the farm's respective location, yield potential, cultivation system and/or strategies.

Disclaimer

The views expressed in this document reflect those of BFAP and do not constitute any specific advice as to decisions or actions that should be taken. Whilst every care has been taken in preparing this document, no representation, warranty, or undertaking (expressed or implied) is given and no responsibility or liability is accepted by BFAP as to the accuracy or completeness of the information contained herein. In addition, BFAP accepts no responsibility or liability for any damages of whatsoever nature which any person may suffer as a result of any decision or action taken on the basis of the information contained herein. All opinions and estimates contained in this report may be changed after publication at any time without notice.

Area coverage

Table 1.1 and Table 1.2 provides an overview of the area of coverage for dryland and irrigated summer crops in South Africa's key agro-ecological producing regions. The coordinators of this initiative are sincerely grateful for the interaction and assistance with data, knowledge and other inputs from each organisation, agribusiness and farmers.

Table 1.1: Area coverage: Dryland

Area	Dryland Crops	Source & Collaborators
KwaZulu-Natal		
Bloedrivier	Maize & Soybeans	GSA / BFAP / Individual Farmers
Mpumalanga		
Middelburg / Trichardt	Maize, Soybeans & Grain Sorghum	GSA / BFAP / Individual Farmers
Ermelo	Maize & Soybeans	GSA / BFAP / Individual Farmers
Eastern Free State		
Reitz region	Maize, soybeans, sunflower & dry beans	GSA / VKB / BFAP / Individual Farmers
Northern Free State		
Northern Free State – Water table soils / higher potential	Maize	GSA / Senwes / BFAP
Northern Free State – Normal potential	Maize	GSA / Senwes / BFAP
Northern Free State	Maize, soybeans, sunflower, ground nuts & grain sorghum	GSA / Senwes / BFAP
North West		
Koster	Maize, soybeans & sunflower	GSA / NWK / BFAP / Individual Farmers
Lichtenburg	Maize, soybeans, sunflower & ground nuts	GSA / NWK / BFAP / Individual Farmers

Table 1.2: Area coverage: Irrigation

Area	Irrigated Crops	Source & Collaborators
Northern Cape		
GWK Area	Maize, soybeans, ground nuts & sunflower	GWK, GSA & BFAP
KwaZulu-Natal		
Bergville	Maize & soybeans	GSA & Individual Farmers
North West		
Brits / Northam / Koedoeskop	Maize, soybeans, sunflower & sorghum	GSA, NWK & Individual Farmers
Limpopo		
Loskop Irrigation Scheme	Maize & Soybeans	GSA & Individual Farmers

Yield Assumptions

Figure 1.1 and Figure 1.2 reports the yield assumptions for dryland and irrigated crops. These assumptions represent target yields which were formulated in round table discussions. These levels are based on crop potential in the respective regions, historic trends and expert opinions. It is important to note that intra-regional variations will occur and it is recommended that producers adjust their target yields based on their location and potential.

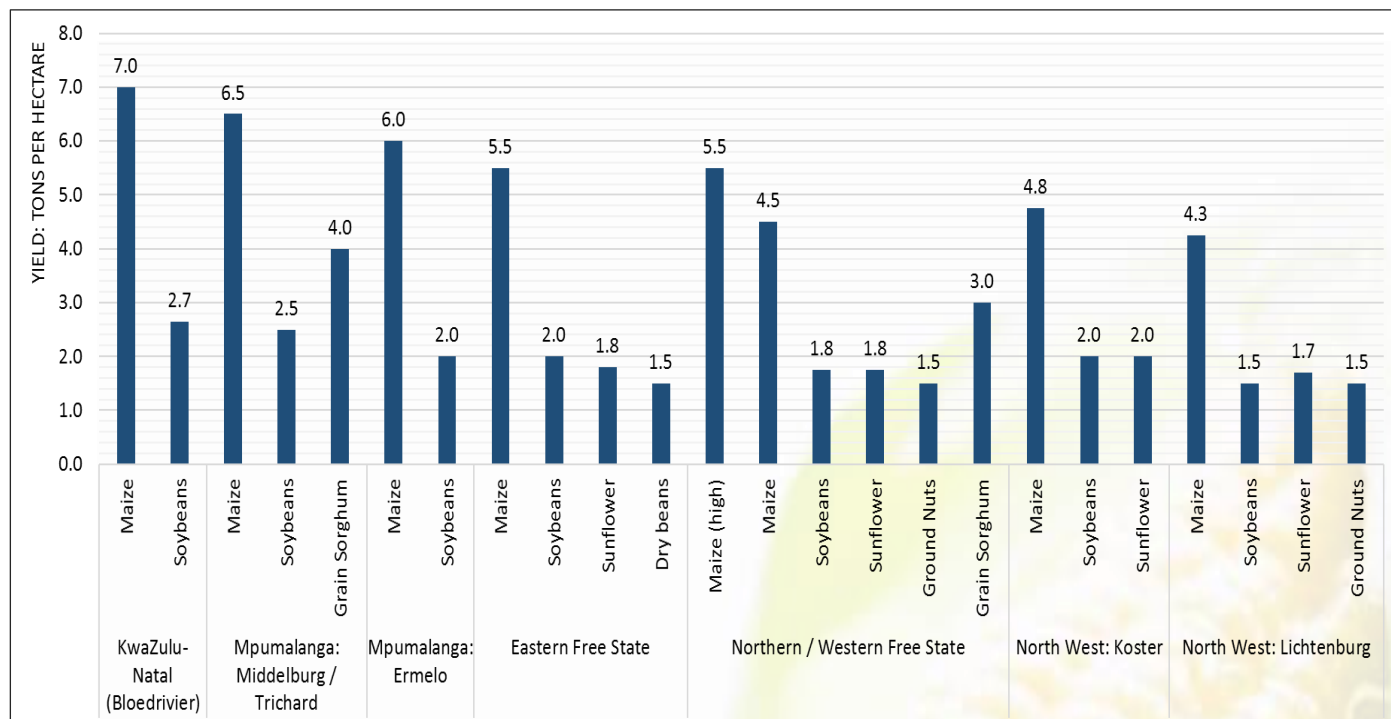


Figure 1.1: Dryland crops yield assumptions

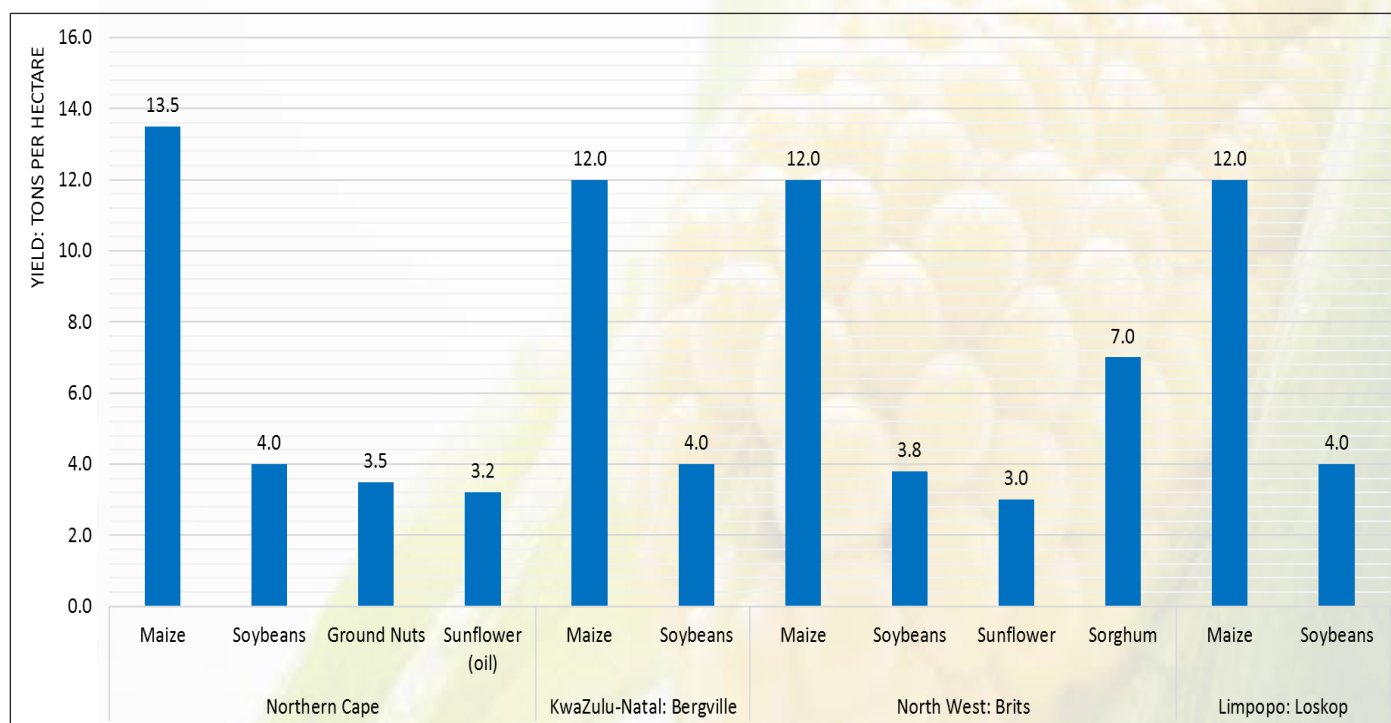


Figure 1.2: Irrigated crops yield assumptions

Crop Price Assumptions

Annually, the Bureau for Food and Agricultural Policy (BFAP) presents a baseline outlook for agricultural production, consumption, prices and trade in South Africa over a 10-year horizon. The outlook is generated within the BFAP system of models and is based on a coherent set of assumptions about a range of economic, technological, environmental, political, institutional, and social factors. Of the range of critical assumptions underpinning the baseline projections, one of the most important is that stable weather conditions will prevail in Southern Africa and around the world; therefore, yields grow constantly over the baseline as technology improves. Consequently, it does not represent a forecast, but rather a single plausible future outcome, based on fundamental factors underpinning markets. It presents a future equilibrium and a benchmark against which further analysis can be measured and understood.

Assumptions related to the future macro-economic environment are based on a combination of projections developed by the International Monetary Fund (IMF), the World Bank and the Bureau for Economic Research (BER) at Stellenbosch University. Baseline projections for world commodity markets were generated by FAPRI at the University of Missouri, as well as the Food and Agriculture Association (FAO) of the United Nations. Once these critical assumptions are captured in the BFAP system of models, the Outlook for all commodities is simulated within a closed system of equations. This captures the interlinkages between sectors and, for example, any shocks in the grain sector are transmitted to the livestock sector and vice versa. For each commodity, important components of supply and demand are identified, after which an equilibrium is established through balance sheet principles by equating total demand to total supply.

Figure 1.3 illustrates the key commodity price assumptions for white maize, yellow maize, sorghum, sunflower and soybeans that were used in the summer crop budgets for the 2020/21 production season. Further deductions were made to calculate a farm gate price for each agro-ecological producing region. The sensitivity analysis in the respective crop budgets makes provision for variation in price and yield and indicates the gross margin under each price and yield combination.

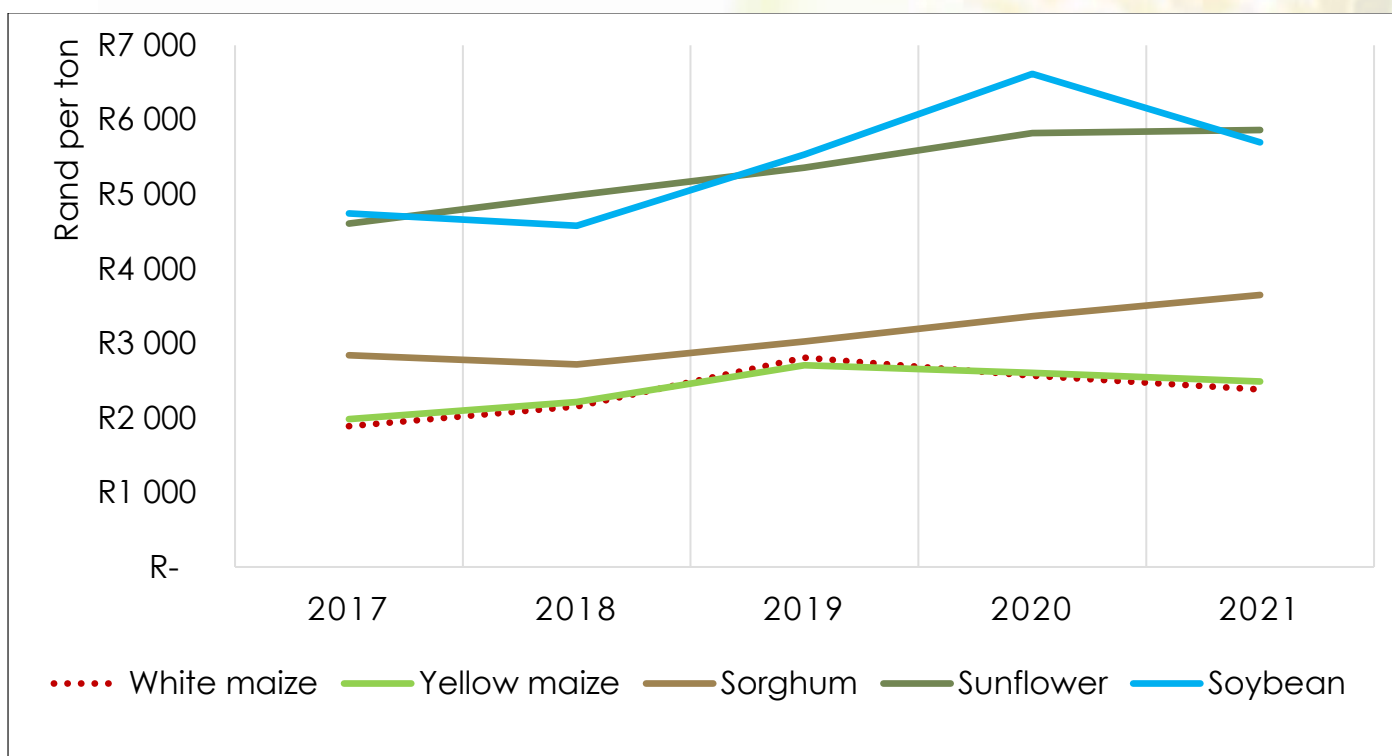


Figure 1.3: BFAP average annual commodity price projections: 2017-2021

Source: BFAP, October 2020

Key Input Cost Trends

Figure 1.4 illustrates the cost trends for fuel and fertilisers over the period from January 2018 to September 2020. Internationally, the cost of ammonia, urea, DAP and KCL have declined year-on-year over the period from March to July, driven mainly by the firm decrease in the Brent crude oil price as a result of the COVID-19 pandemic. Over the same period, the Rand has depreciated significantly, causing domestic prices for fertiliser to increase year-on-year. Over the period from January to September (2019 vs. 2020), the cost for urea and LAN28 reported only a marginal increase between 1.7-2.5%. The cost for MAP and KCL trended lower opposed to the same period in 2019 (4.2% and 0.7% respectively).

Figure 1.5 presents an overview on the year-on-year percentage changes for the cost of herbicides and insecticides in international and domestic markets. It considers the period from March to September. Internationally, the cost for herbicides has decreased by 5% over the period. As a result of the weaker exchange rate, domestic herbicides reported an increase of 12%. For insecticides, international prices were 24% lower and domestically, a decrease of 10%.

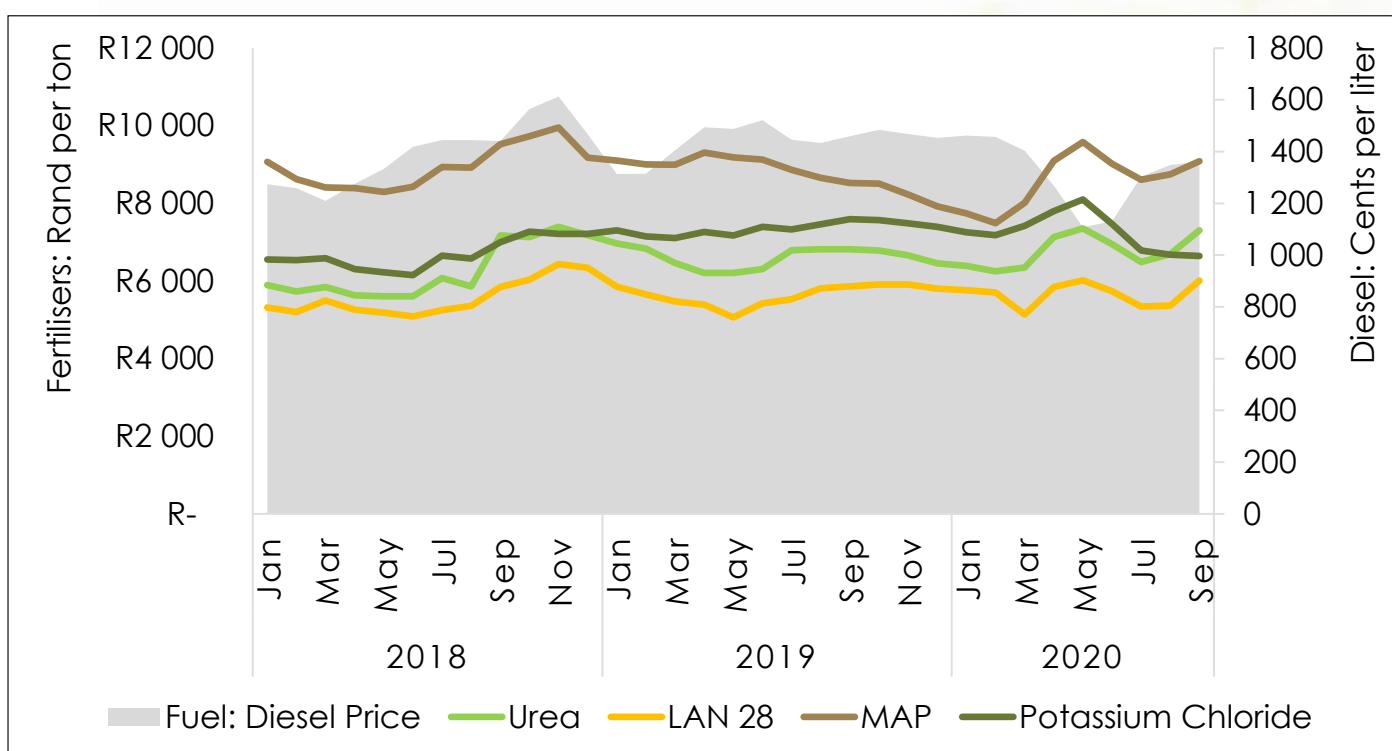


Figure 1.4: Fertiliser & fuel cost trends: January 2018 to September 2020

Source: Grain SA, October 2020

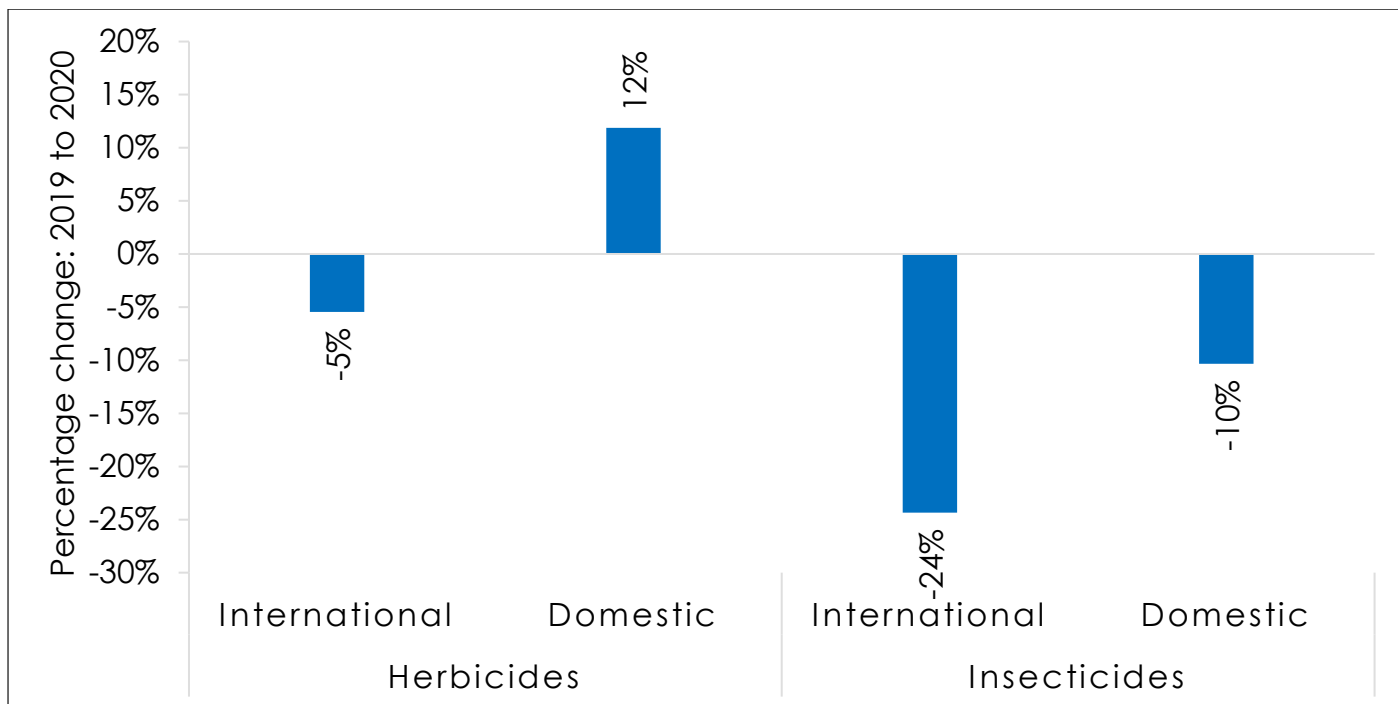


Figure 1.5: Plant protection cost trends: Percentage change 2019 – 2020 (Average from March to September)

Source: Grain SA, October 2020

Methodology, Approach & Definitions

- ❖ A standard operating procedure was used across all crops and regions for generating the cost and income budgets for the 2020/21 production season.
- ❖ Deterministic or target yields were based on industry discussions which refers to a yield that should be obtained given a normal production season with normal weather in the respective agro-ecological production regions.
- ❖ The farm gate price for each crop was calculated by deducting transport differential, grade differential, handling fees, commission and levies (statutory) from the simulated SAFEX price.
- ❖ The gross production value is then calculated by multiplying the yield with the farm gate price.
- ❖ The direct costs are calculated by multiplying the cost per unit by the estimated quantity of input use or application rate.
- ❖ For the majority of the crops, it was assumed that own machinery was used, except for speciality operations that is coupled with economies of scale. In such cases, a contracting cost item was allocated. For all crops, provision was made for hail insurance.
- ❖ Fertiliser and lime application will vary significantly in regions and across crops, however, an attempt was made to follow a standardised approach across the regions. Micro-elements and foliar feed for selective crops are included in the total fertiliser cost.
- ❖ Fuel consumption is based on the prevalence production system in each region.
- ❖ For plant protection, herbicide, insecticide and fungicides are accounted for based on interaction with industry experts and producers. For instance, in certain regions provision was made for fungicide sprays, but for others where the practise is not common, fungicides were excluded from plant protection costs.
- ❖ Repairs and maintenance costs are calculated based on the production system operations.
- ❖ For seed, an assumption was made in terms of the majority of crop type area that is cultivated in each region. For instance, the cost of maize seed in Northern-Natal, Mpumalanga and Eastern Free State is based on the assumption that the majority of the area under maize cultivation is yellow maize whereas for the western producing regions, white maize was assumed. An average seed price across various seed companies was used for 1) conventional seeds and 2) GM-technology. The cost of seed per hectare is calculated by multiplying the cost per unit (either kilograms or plant population) by the application rate per hectare. For selective crops, seed treatment was included where relevant. For predominantly oilseeds production, the seed application rate was sub-divided according to own and purchased seed. For own seed use, a cost was also allocated which is based on a realistic crop price (hence, opportunity cost) and seed preparation costs such as sifting and treatment.
- ❖ For irrigated crops, the cost of water and electricity was calculated according to typical irrigation application rates at their respective regional costs per millimetre. For instance, variations will occur in the cost for water in areas where predominantly boreholes are used compared to irrigation/water scheme areas.
- ❖ The gross margin was calculated by subtracting the direct cost from the gross production value.

2020/21 INCOME & COST BUDGETS – DRYLAND PRODUCTION REGIONS

KwaZulu-Natal

Table 2.1: Income & cost budgets for maize & soybeans for KwaZulu-Natal (Bloedrivier Region) - Dryland

KwaZulu-Natal: Bloedrivier			
Crop		Maize	Soybeans
Production System		Dryland	Dryland
1) INCOME			
Yield: Deterministic	T/HA	7.00	2.65
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897
Total deductions	R/TON	R413	R139
- Transport differential	R/TON	R353	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R60	R139
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2,220	R5,758
GROSS INCOME	R/HA	R15,538	R15,259
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R-	R-
Crop insurance	R/HA	R590	R1,862
Fertilizer	R/HA	R3,416	R1,433
Lime	R/HA	R613	R-
Seed	R/HA	R2,764	R1,272
Fuel	R/HA	R920	R558
Herbicide	R/HA	R1,192	R1,387
Insecticide/Fungicide	R/HA	R544	R957
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R714	R443
Casual labour	R/HA	R178	R-
Aerial spray	R/HA	R-	R-
Other expenditure	R/HA	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R10,930	R7,912
TOTAL VARIABLE EXPENDITURE	R/TON	R1,561	R2,986
3.1) GROSS MARGIN:	R/HA	R4,608	R7,347
3.2) GROSS MARGIN:	R/TON	R658	R2,772
BREAK-EVEN YIELD	T/HA	4.92	1.37
BREAK-EVEN PRICE	R/TON	R1,561	R2,986

Source: BFAP, GSA & Individual Farmers, 2020

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): KWAZULU-NATAL: BLOEDRIVIER

PRICE (R/TON)														
YIELD	R	5,458	R	5,558	R	5,658	R	5,758	R	5,858	R	5,958	R	6,058
1.65	-R	3,514	-R	3,349	-R	3,184	-R	3,019	-R	2,854	-R	2,689	-R	2,524
1.90	-R	2,150	-R	1,960	-R	1,770	-R	1,580	-R	1,390	-R	1,200	-R	1,010
2.15	-R	785	-R	570	-R	355	-R	140	R	75	R	290	R	505
2.40	R	580	R	820	R	1,060	R	1,300	R	1,540	R	1,780	R	2,020
2.65	R	1,944	R	2,209	R	2,474	R	2,739	R	3,004	R	3,269	R	3,534
2.90	R	3,309	R	3,599	R	3,889	R	4,179	R	4,469	R	4,759	R	5,049
3.15	R	4,673	R	4,988	R	5,303	R	5,618	R	5,933	R	6,248	R	6,563
3.40	R	6,038	R	6,378	R	6,718	R	7,058	R	7,398	R	7,738	R	8,078
3.65	R	7,402	R	7,767	R	8,132	R	8,497	R	8,862	R	9,227	R	9,592

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 140:22:22. Soybeans N:P:K – 10:18:36.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

Mpumalanga

Table 2.2: Income & cost budgets for maize, soybeans & grain sorghum for Mpumalanga - Dryland

		Middelburg / Trichardt			Ermelo	
Crop		Maize	Soybeans	Grain Sorghum	Maize	Soybeans
Production System		Dryland	Dryland	Dryland	Dryland	Dryland
1) INCOME						
Yield: Deterministic	T/HA	6.50	2.50	4.00	6.00	2.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897	R2,926	R2,633	R5,897
Total deductions	R/TON	R304	R139	R63	R353	R139
- Transport differential	R/TON	R244	R-	R-	R293	R-
- Grade differential	R/TON	R-	R-	R-	R-	R-
- Marketing & Handling	R/TON	R60	R139	R63	R60	R139
Price premiums	R/TON	R-	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,329	R5,758	R2,863	R2,280	R5,758
GROSS INCOME	R/HA	R15,137	R14,395	R11,454	R13,678	R11,516
2) VARIABLE EXPENDITURES						
Contracting	R/HA	R-	R-	R-	R-	R-
Crop insurance	R/HA	R575	R1,180	R344	R520	R944
Fertilizer	R/HA	R3,309	R1,093	R1,754	R3,096	R990
Lime	R/HA	R613	R-	R613	R613	R-
Seed	R/HA	R2,487	R1,091	R540	R2,211	R1,000
Fuel	R/HA	R1,047	R558	R861	R892	R540
Herbicide	R/HA	R1,192	R1,387	R714	R1,192	R1,387
Insecticide/Fungicide	R/HA	R544	R957	R836	R544	R957
Marketing costs	R/HA	R-	R-	R-	R-	R-
Repairs and maintenance	R/HA	R714	R443	R685	R706	R440
Casual labour	R/HA	R178	R-	R178	R178	R-
Aerial spray	R/HA	R-	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R200	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R10,659	R6,710	R6,725	R9,951	R6,259
TOTAL VARIABLE EXPENDITURE	R/TON	R1,640	R2,684	R1,681	R1,659	R3,129
3.1) GROSS MARGIN:	R/HA	R4,478	R7,686	R4,729	R3,727	R5,258
3.2) GROSS MARGIN:	R/TON	R689	R3,074	R1,182	R621	R2,629
BREAK-EVEN YIELD	T/HA	4.58	1.17	2.35	4.37	1.09
BREAK-EVEN PRICE	R/TON	R1,640	R2,684	R1,681	R1,659	R3,129

Source: BFAP, GSA & Individual Farmers, 2020

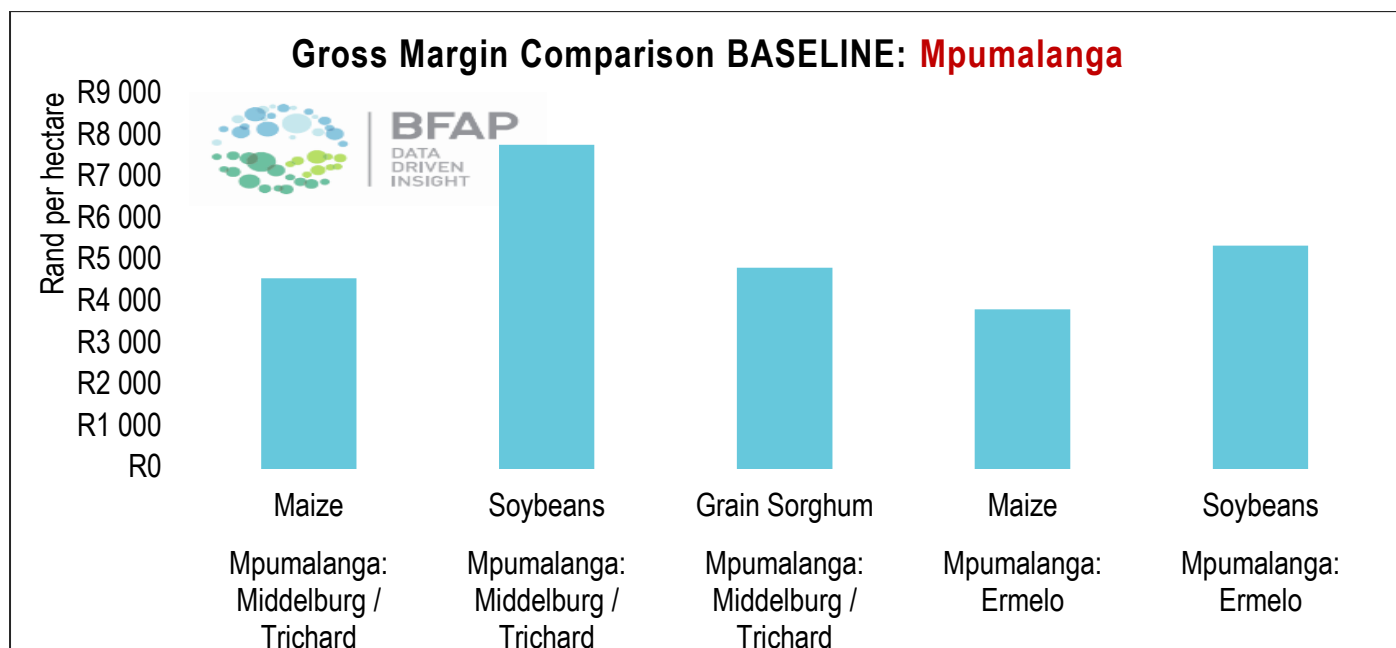


Figure 2.2: Gross margin comparison – Baseline: Mpumalanga

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): MPUMALANGA: MIDDELBURG / TRICHARD														
YIELD (T/HA)														
PRODUCERS PRICE	5.00		5.50		6.00		6.50		7.00		7.50		8.00	
R1,929	-R	1,015	-R	51	R	914	R	1,878	R	2,842	R	3,807	R	4,771
R2,029	-R	515	R	499	R	1,514	R	2,528	R	3,542	R	4,557	R	5,571
R2,129	-R	15	R	1,049	R	2,114	R	3,178	R	4,242	R	5,307	R	6,371
R2,229	R	485	R	1,599	R	2,714	R	3,828	R	4,942	R	6,057	R	7,171
R2,329	R	985	R	2,149	R	3,314	R	4,478	R	5,642	R	6,807	R	7,971
R2,429	R	1,485	R	2,699	R	3,914	R	5,128	R	6,342	R	7,557	R	8,771
R2,529	R	1,985	R	3,249	R	4,514	R	5,778	R	7,042	R	8,307	R	9,571
R2,629	R	2,485	R	3,799	R	5,114	R	6,428	R	7,742	R	9,057	R	10,371
R2,729	R	2,985	R	4,349	R	5,714	R	7,078	R	8,442	R	9,807	R	11,171

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): MPUMALANGA: MIDDELBURG / TRICHARD															
YIELD (T/HA)															
PRODUCERS PRICE		1.75		2.00		2.25		2.50		2.75		3.00		3.25	
R5,358	R	2,667	R	4,007	R	5,346	R	6,686	R	8,025	R	9,365	R	10,704	
R5,458	R	2,842	R	4,207	R	5,571	R	6,936	R	8,300	R	9,665	R	11,029	
R5,558	R	3,017	R	4,407	R	5,796	R	7,186	R	8,575	R	9,965	R	11,354	
R5,658	R	3,192	R	4,607	R	6,021	R	7,436	R	8,850	R	10,265	R	11,679	
R5,758	R	3,367	R	4,807	R	6,246	R	7,686	R	9,125	R	10,565	R	12,004	
R5,858	R	3,542	R	5,007	R	6,471	R	7,936	R	9,400	R	10,865	R	12,329	
R5,958	R	3,717	R	5,207	R	6,696	R	8,186	R	9,675	R	11,165	R	12,654	
R6,058	R	3,892	R	5,407	R	6,921	R	8,436	R	9,950	R	11,465	R	12,979	
R6,158	R	4,067	R	5,607	R	7,146	R	8,686	R	10,225	R	11,765	R	13,304	

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): MPUMALANGA: ERMELO														
YIELD (T/HA)														
PRODUCERS PRICE		4.50		5.00		5.50		6.00		6.50		7.00	7.50	
R1,880	-R	1,492	-R	553	R	387	R	1,327	R	2,267	R	3,207	R	4,147
R1,980	-R	1,042	-R	53	R	937	R	1,927	R	2,917	R	3,907	R	4,897
R2,080	-R	592	R	447	R	1,487	R	2,527	R	3,567	R	4,607	R	5,647
R2,180	-R	142	R	947	R	2,037	R	3,127	R	4,217	R	5,307	R	6,397
R2,280	R	308	R	1,447	R	2,587	R	3,727	R	4,867	R	6,007	R	7,147
R2,380	R	758	R	1,947	R	3,137	R	4,327	R	5,517	R	6,707	R	7,897
R2,480	R	1,208	R	2,447	R	3,687	R	4,927	R	6,167	R	7,407	R	8,647
R2,580	R	1,658	R	2,947	R	4,237	R	5,527	R	6,817	R	8,107	R	9,397
R2,680	R	2,108	R	3,447	R	4,787	R	6,127	R	7,467	R	8,807	R	10,147

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): MPUMALANGA: ERMELO															
YIELD (T/HA)															
PRODUCERS PRICE		1.25		1.50		1.75		2.00		2.25		2.50		2.75	
R5,358	R	439	R	1,779	R	3,118	R	4,458	R	5,797	R	7,137	R	8,476	
R5,458	R	564	R	1,929	R	3,293	R	4,658	R	6,022	R	7,387	R	8,751	
R5,558	R	689	R	2,079	R	3,468	R	4,858	R	6,247	R	7,637	R	9,026	
R5,658	R	814	R	2,229	R	3,643	R	5,058	R	6,472	R	7,887	R	9,301	
R5,758	R	939	R	2,379	R	3,818	R	5,258	R	6,697	R	8,137	R	9,576	
R5,858	R	1,064	R	2,529	R	3,993	R	5,458	R	6,922	R	8,387	R	9,851	
R5,958	R	1,189	R	2,679	R	4,168	R	5,658	R	7,147	R	8,637	R	10,126	
R6,058	R	1,314	R	2,829	R	4,343	R	5,858	R	7,372	R	8,887	R	10,401	
R6,158	R	1,439	R	2,979	R	4,518	R	6,058	R	7,597	R	9,137	R	10,676	

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): MPUMALANGA: MIDDELBURG / TRICHARD														
PRICE (R/TON)														
YIELD	R	5,458	R	5,558	R	5,658	R	5,758	R	5,858	R	5,958	R	6,058
1.50	-R	3,000	-R	2,850	-R	2,700	-R	2,550	-R	2,400	-R	2,250	-R	2,100
1.75	-R	1,636	-R	1,461	-R	1,286	-R	1,111	-R	936	-R	761	-R	586
2.00	-R	271	-R	71	R	129	R	329	R	529	R	729	R	929
2.25	R	1,093	R	1,318	R	1,543	R	1,768	R	1,993	R	2,218	R	2,443
2.50	R	2,458	R	2,708	R	2,958	R	3,208	R	3,458	R	3,708	R	3,958
2.75	R	3,822	R	4,097	R	4,372	R	4,647	R	4,922	R	5,197	R	5,472
3.00	R	5,187	R	5,487	R	5,787	R	6,087	R	6,387	R	6,687	R	6,987
3.25	R	6,551	R	6,876	R	7,201	R	7,526	R	7,851	R	8,176	R	8,501
3.50	R	7,916	R	8,266	R	8,616	R	8,966	R	9,316	R	9,666	R	10,016

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): MPUMALANGA: ERMELO														
PRICE (R/TON)														
YIELD	R	5,458	R	5,558	R	5,658	R	5,758	R	5,858	R	5,958	R	6,058
1.00	-R	4,528	-R	4,428	-R	4,328	-R	4,228	-R	4,128	-R	4,028	-R	3,928
1.25	-R	3,163	-R	3,038	-R	2,913	-R	2,788	-R	2,663	-R	2,538	-R	2,413
1.50	-R	1,799	-R	1,649	-R	1,499	-R	1,349	-R	1,199	-R	1,049	-R	899
1.75	-R	434	-R	259	-R	84	R	91	R	266	R	441	R	616
2.00	R	930	R	1,130	R	1,330	R	1,530	R	1,730	R	1,930	R	2,130
2.25	R	2,295	R	2,520	R	2,745	R	2,970	R	3,195	R	3,420	R	3,645
2.50	R	3,660	R	3,910	R	4,160	R	4,410	R	4,660	R	4,910	R	5,160
2.75	R	5,024	R	5,299	R	5,574	R	5,849	R	6,124	R	6,399	R	6,674
3.00	R	6,389	R	6,689	R	6,989	R	7,289	R	7,589	R	7,889	R	8,189

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.

- Fertiliser assumptions (kg/ha): Maize (Middelburg/Trichard) N:P:K – 130:21:30. Soybeans (Middelburg/Trichard) N:P:K – 10:14:20. Grain sorghum N:P:K – 87:8:11. Maize (Ermelo) N:P:K – 117:21:30. Soybeans (Ermelo) N:P:K – 10:12:18.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.



Eastern Free State

Table 2.3: Income & cost budgets for maize, soybeans, sunflower & dry beans for Eastern Free State - Dryland

Eastern Free State					
Crop		Maize	Soybeans	Sunflower	Dry beans
Production System		Dryland	Dryland	Dryland	Dryland
1) INCOME					
Yield: Deterministic	T/HA	5.50	2.00	1.80	1.50
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897	R5,979	R11,500
Total deductions	R/TON	R379	R143	R359	R359
- Transport differential	R/TON	R319	R-	R266	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R60	R143	R93	R359
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,254	R5,754	R5,620	R11,141
GROSS INCOME	R/HA	R12,396	R11,508	R10,115	R16,711
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R-	R-	R-	R1,235
Crop insurance	R/HA	R372	R1,151	R506	R1,471
Fertilizer	R/HA	R2,486	R1,458	R878	R1,327
Lime	R/HA	R541	R-	R-	R460
Seed	R/HA	R1,548	R1,090	R708	R3,551
Fuel	R/HA	R946	R747	R715	R655
Herbicide	R/HA	R888	R882	R1,097	R1,364
Insecticide/Fungicide	R/HA	R562	R671	R155	R1,276
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R836	R768	R751	R727
Casual labour	R/HA	R178	R-	R-	R1,834
Aerial spray	R/HA	R-	R-	R-	R-
Other expenditure	R/HA	R-	R302	R-	R125
TOTAL VARIABLE EXPENDITURE	R/HA	R8,357	R7,070	R4,810	R14,025
TOTAL VARIABLE EXPENDITURE	R/TON	R1,519	R3,535	R2,672	R9,350
3.1) GROSS MARGIN:	R/HA	R4,039	R4,438	R5,306	R2,685
3.2) GROSS MARGIN:	R/TON	R734	R2,219	R2,948	R1,790
BREAK-EVEN YIELD	T/HA	3.71	1.23	0.86	1.26
BREAK-EVEN PRICE	R/TON	R1,519	R3,535	R2,672	R9,350

Source: BFAP, GSA, VKB & Individual Farmers, 2020

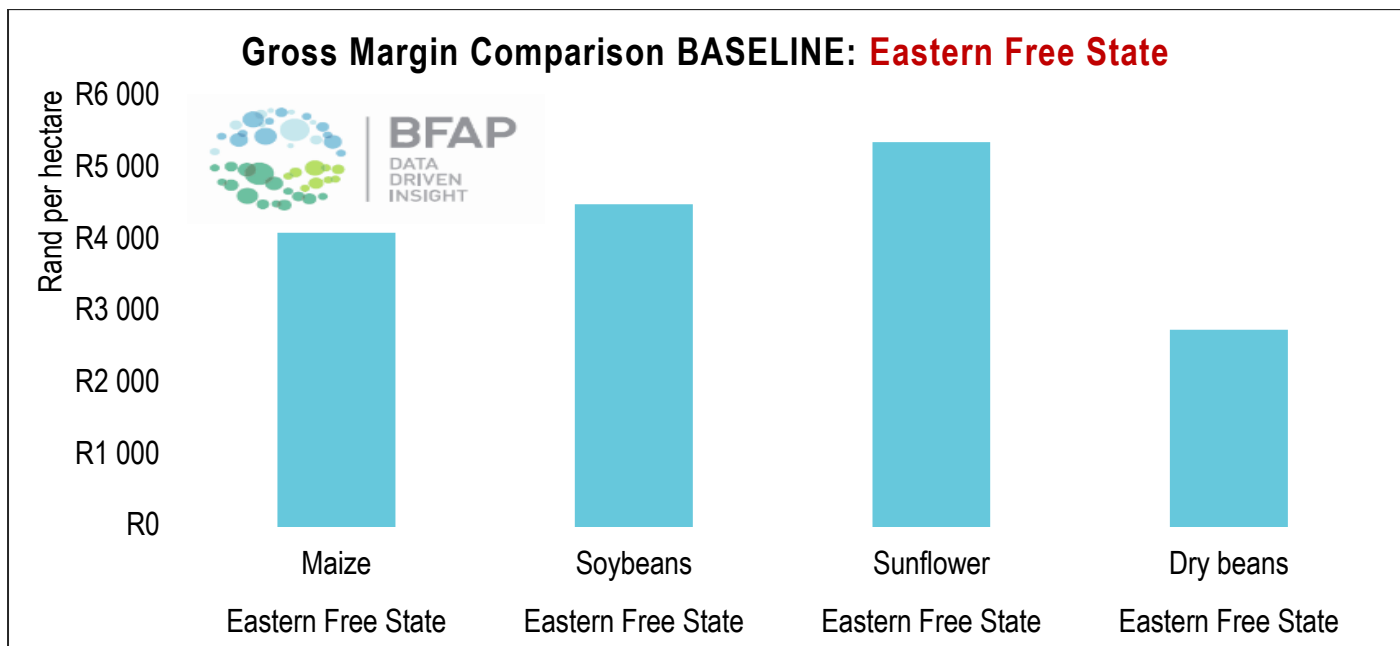


Figure 2.3: Gross margin comparison – Baseline: Eastern Free State

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): EASTERN FREE STATE										
YIELD (T/HA)										
PRODUCERS PRICE	4.00		4.50		5.00		5.50		6.00	
R1,854	-R	942	-R	15	R	912	R	1,839	R	2,766
R1,954	-R	542	R	435	R	1,412	R	2,389	R	3,366
R2,054	-R	142	R	885	R	1,912	R	2,939	R	3,966
R2,154	R	258	R	1,335	R	2,412	R	3,489	R	4,566
R2,254	R	658	R	1,785	R	2,912	R	4,039	R	5,166
R2,354	R	1,058	R	2,235	R	3,412	R	4,589	R	5,766
R2,454	R	1,458	R	2,685	R	3,912	R	5,139	R	6,366
R2,554	R	1,858	R	3,135	R	4,412	R	5,689	R	6,966
R2,654	R	2,258	R	3,585	R	4,912	R	6,239	R	7,566

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): EASTERN FREE STATE										
YIELD (T/HA)										
PRODUCERS PRICE	1.25		1.50		1.75		2.00		2.25	
R5,354	-R	377	R	961	R	2,300	R	3,638	R	4,977
R5,454	-R	252	R	1,111	R	2,475	R	3,838	R	5,202
R5,554	-R	127	R	1,261	R	2,650	R	4,038	R	5,427
R5,654	-R	2	R	1,411	R	2,825	R	4,238	R	5,652
R5,754	R	123	R	1,561	R	3,000	R	4,438	R	5,877
R5,854	R	248	R	1,711	R	3,175	R	4,638	R	6,102
R5,954	R	373	R	1,861	R	3,350	R	4,838	R	6,327
R6,054	R	498	R	2,011	R	3,525	R	5,038	R	6,552
R6,154	R	623	R	2,161	R	3,700	R	5,238	R	6,777

SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): EASTERN FREE STATE

YIELD (T/HA)															
PRODUCERS PRICE		1.00		1.25		1.50		1.80		2.00		2.25		2.50	
R5,220	R	410	R	1,715	R	3,020	R	4,586	R	5,630	R	6,935	R	8,240	
R5,320	R	510	R	1,840	R	3,170	R	4,766	R	5,830	R	7,160	R	8,490	
R5,420	R	610	R	1,965	R	3,320	R	4,946	R	6,030	R	7,385	R	8,740	
R5,520	R	710	R	2,090	R	3,470	R	5,126	R	6,230	R	7,610	R	8,990	
R5,620	R	810	R	2,215	R	3,620	R	5,306	R	6,430	R	7,835	R	9,240	
R5,720	R	910	R	2,340	R	3,770	R	5,486	R	6,630	R	8,060	R	9,490	
R5,820	R	1,010	R	2,465	R	3,920	R	5,666	R	6,830	R	8,285	R	9,740	
R5,920	R	1,110	R	2,590	R	4,070	R	5,846	R	7,030	R	8,510	R	9,990	
R6,020	R	1,210	R	2,715	R	4,220	R	6,026	R	7,230	R	8,735	R	10,240	

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): EASTERN FREE STATE

		PRICE (R/TON)												
YIELD	R	5,454	R	5,554	R	5,654	R	5,754	R	5,854	R	5,954	R	6,054
1.00	-R	5,655	-R	5,555	-R	5,455	-R	5,355	-R	5,255	-R	5,155	-R	5,055
1.25	-R	4,291	-R	4,166	-R	4,041	-R	3,916	-R	3,791	-R	3,666	-R	3,541
1.50	-R	2,928	-R	2,778	-R	2,628	-R	2,478	-R	2,328	-R	2,178	-R	2,028
1.75	-R	1,564	-R	1,389	-R	1,214	-R	1,039	-R	864	-R	689	-R	514
2.00	-R	200	-R	0	R	200	R	400	R	600	R	800	R	1,000
2.25	R	1,163	R	1,388	R	1,613	R	1,838	R	2,063	R	2,288	R	2,513
2.50	R	2,527	R	2,777	R	3,027	R	3,277	R	3,527	R	3,777	R	4,027
2.75	R	3,890	R	4,165	R	4,440	R	4,715	R	4,990	R	5,265	R	5,540
3.00	R	5,254	R	5,554	R	5,854	R	6,154	R	6,454	R	6,754	R	7,054

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 83:26:13. Soybeans N:P:K – 14:21:28. Sunflower N:P:K – 35:8:8. Dry beans N:P:K – 40:15:20.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

Northern Free State

Table 2.4: Income & cost budgets for maize, soybeans, sunflower, ground nuts & grain sorghum for Western / Northern Free State - Dryland

Area		Western / Northern Free State					
Crop		Maize - Higher potential	Maize – Normal potential	Soybean	Sunflower	Ground Nuts	Grain Sorghum
Production System		Dryland	Dryland	Dryland	Dryland	Dryland	Dryland
1) INCOME							
Yield: Deterministic	T/HA	5.50	4.50	1.75	1.75	1.50	3.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R2,552	R5,897	R5,979	R8,875	R2,926
Total deductions	R/TON	R339	R296	R143	R380	R63	R80
- Transport differential	R/TON	R276	R233	R-	R261	R-	R-
- Grade differential	R/TON	R-	R-	R-	R-	R-	R17
- Marketing & Handling	R/TON	R63	R63	R143	R119	R63	R63
Price premiums	R/TON	R-	R-	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,294	R2,256	R5,754	R5,599	R8,812	R2,846
GROSS INCOME	R/HA	R12,616	R10,152	R10,070	R9,798	R13,218	R8,539
2) VARIABLE EXPENDITURES							
Contracting	R/HA	R-	R-	R-	R-	R-	R-
Crop insurance	R/HA	R353	R112	R926	R382	R159	R273
Fertilizer	R/HA	R2,450	R2,133	R795	R1,219	R1,121	R1,620
Lime	R/HA	R257	R257	R-	R-	R141	R150
Seed	R/HA	R1,323	R939	R836	R503	R1,619	R315
Fuel	R/HA	R980	R971	R693	R756	R973	R901
Herbicide	R/HA	R1,111	R984	R538	R183	R842	R714
Insecticide/Fungicide	R/HA	R562	R35	R17	R31	R751	R836
Marketing costs	R/HA	R-	R-	R-	R-	R-	R-
Repairs and maintenance	R/HA	R753	R746	R746	R640	R857	R782
Casual labour	R/HA	R178	R178	R-	R150	R-	R149
Aerial spray	R/HA	R-	R-	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-	R-	R180	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R7,967	R6,356	R4,552	R3,865	R6,642	R5,740
TOTAL VARIABLE EXPENDITURE	R/TON	R1,449	R1,412	R2,601	R2,209	R4,428	R1,913
3.1) GROSS MARGIN:	R/HA	R4,648	R3,795	R5,518	R5,932	R6,576	R2,798
3.2) GROSS MARGIN:	R/TON	R845	R843	R3,153	R3,390	R4,384	R933
BREAK-EVEN YIELD	T/HA	3.47	2.82	0.79	0.69	0.75	2.02
BREAK-EVEN PRICE	R/TON	R1,449	R1,412	R2,601	R2,209	R4,428	R1,913

Source: BFAP, GSA & Senwes, 2020

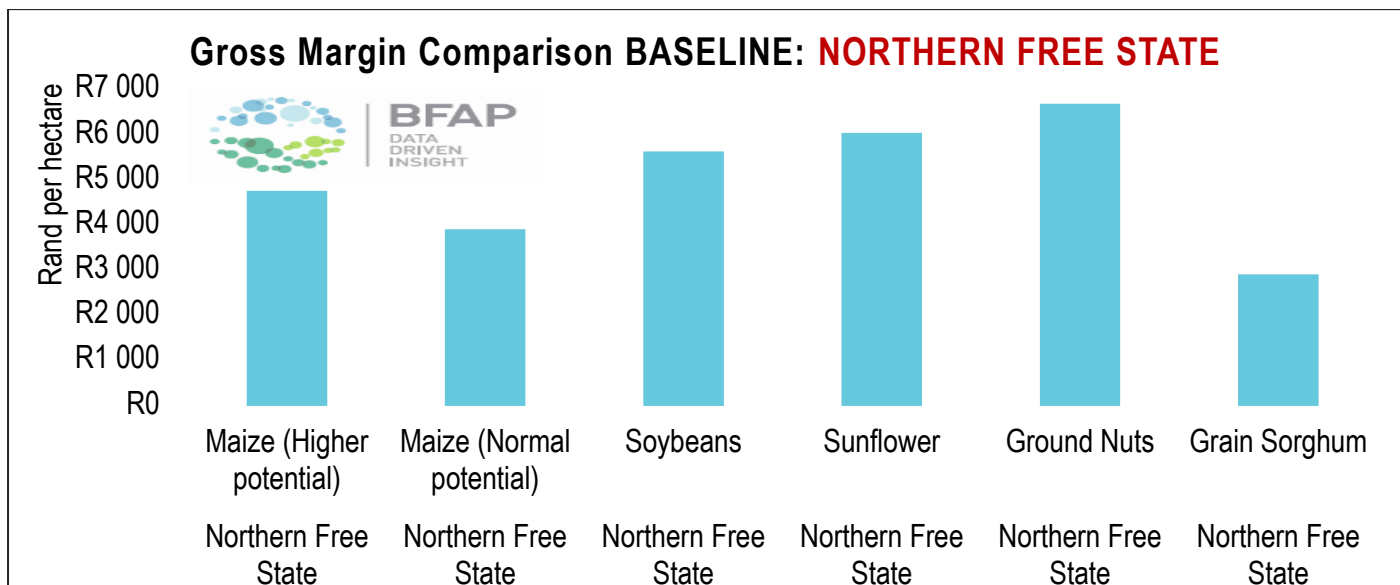


Figure 2.4: Gross margin comparison – Baseline: Western / Northern Free State

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE HIGHER POTENTIAL SOILS														
		YIELD (T/HA)												
PRODUCERS PRICE		4.00		4.50		5.00		5.50		6.00		6.50		7.00
R1,894	-R	392	R	554	R	1,501	R	2,448	R	3,395	R	4,342	R	5,289
R1,994	R	8	R	1,004	R	2,001	R	2,998	R	3,995	R	4,992	R	5,989
R2,094	R	408	R	1,454	R	2,501	R	3,548	R	4,595	R	5,642	R	6,689
R2,194	R	808	R	1,904	R	3,001	R	4,098	R	5,195	R	6,292	R	7,389
R2,294	R	1,208	R	2,354	R	3,501	R	4,648	R	5,795	R	6,942	R	8,089
R2,394	R	1,608	R	2,804	R	4,001	R	5,198	R	6,395	R	7,592	R	8,789
R2,494	R	2,008	R	3,254	R	4,501	R	5,748	R	6,995	R	8,242	R	9,489
R2,594	R	2,408	R	3,704	R	5,001	R	6,298	R	7,595	R	8,892	R	10,189
R2,694	R	2,808	R	4,154	R	5,501	R	6,848	R	8,195	R	9,542	R	10,889

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE NORMAL POTENTIAL SOILS															
		YIELD (T/HA)													
PRODUCERS PRICE		1.00		1.25		1.50		1.75		2.00		2.25		2.50	
R5,354	R	803	R	2,141	R	3,480	R	4,818	R	6,157	R	7,495	R	8,834	
R5,454	R	903	R	2,266	R	3,630	R	4,993	R	6,357	R	7,720	R	9,084	
R5,554	R	1,003	R	2,391	R	3,780	R	5,168	R	6,557	R	7,945	R	9,334	
R5,654	R	1,103	R	2,516	R	3,930	R	5,343	R	6,757	R	8,170	R	9,584	
R5,754	R	1,203	R	2,641	R	4,080	R	5,518	R	6,957	R	8,395	R	9,834	
R5,854	R	1,303	R	2,766	R	4,230	R	5,693	R	7,157	R	8,620	R	10,084	
R5,954	R	1,403	R	2,891	R	4,380	R	5,868	R	7,357	R	8,845	R	10,334	
R6,054	R	1,503	R	3,016	R	4,530	R	6,043	R	7,557	R	9,070	R	10,584	
R6,154	R	1,603	R	3,141	R	4,680	R	6,218	R	7,757	R	9,295	R	10,834	

SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE															
YIELD (T/HA)															
PRODUCERS PRICE		1.00		1.25		1.50		1.75		2.00		2.25		2.50	
R5,199	R	1,333	R	2,633	R	3,933	R	5,232	R	6,532	R	7,832	R	9,131	
R5,299	R	1,433	R	2,758	R	4,083	R	5,407	R	6,732	R	8,057	R	9,381	
R5,399	R	1,533	R	2,883	R	4,233	R	5,582	R	6,932	R	8,282	R	9,631	
R5,499	R	1,633	R	3,008	R	4,383	R	5,757	R	7,132	R	8,507	R	9,881	
R5,599	R	1,733	R	3,133	R	4,533	R	5,932	R	7,332	R	8,732	R	10,131	
R5,699	R	1,833	R	3,258	R	4,683	R	6,107	R	7,532	R	8,957	R	10,381	
R5,799	R	1,933	R	3,383	R	4,833	R	6,282	R	7,732	R	9,182	R	10,631	
R5,899	R	2,033	R	3,508	R	4,983	R	6,457	R	7,932	R	9,407	R	10,881	
R5,999	R	2,133	R	3,633	R	5,133	R	6,632	R	8,132	R	9,632	R	11,131	

GROUND NUTS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE															
YIELD (T/HA)															
PRODUCERS PRICE		0.75		1.00		1.25		1.50		1.75		2.00		2.25	
R8,412	R	342	R	2,670	R	4,998	R	7,326	R	9,654	R	11,982	R	14,310	
R8,512	R	417	R	2,770	R	5,123	R	7,476	R	9,829	R	12,182	R	14,535	
R8,612	R	492	R	2,870	R	5,248	R	7,626	R	10,004	R	12,382	R	14,760	
R8,712	R	567	R	2,970	R	5,373	R	7,776	R	10,179	R	12,582	R	14,985	
R8,812	R	642	R	3,070	R	5,498	R	7,926	R	10,354	R	12,782	R	15,210	
R8,912	R	717	R	3,170	R	5,623	R	8,076	R	10,529	R	12,982	R	15,435	
R9,012	R	792	R	3,270	R	5,748	R	8,226	R	10,704	R	13,182	R	15,660	
R9,112	R	867	R	3,370	R	5,873	R	8,376	R	10,879	R	13,382	R	15,885	
R9,212	R	942	R	3,470	R	5,998	R	8,526	R	11,054	R	13,582	R	16,110	

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE														
PRICE (R/TON)														
YIELD	R	5,454	R	5,554	R	5,654	R	5,754	R	5,854	R	5,954	R	6,054
0.75	-R	5,109	-R	5,034	-R	4,959	-R	4,884	-R	4,809	-R	4,734	-R	4,659
1.00	-R	3,746	-R	3,646	-R	3,546	-R	3,446	-R	3,346	-R	3,246	-R	3,146
1.25	-R	2,382	-R	2,257	-R	2,132	-R	2,007	-R	1,882	-R	1,757	-R	1,632
1.50	-R	1,019	-R	869	-R	719	-R	569	-R	419	-R	269	-R	119
1.75	R	345	R	520	R	695	R	870	R	1,045	R	1,220	R	1,395
2.00	R	1,709	R	1,909	R	2,109	R	2,309	R	2,509	R	2,709	R	2,909
2.25	R	3,072	R	3,297	R	3,522	R	3,747	R	3,972	R	4,197	R	4,422
2.50	R	4,436	R	4,686	R	4,936	R	5,186	R	5,436	R	5,686	R	5,936
2.75	R	5,799	R	6,074	R	6,349	R	6,624	R	6,899	R	7,174	R	7,449

Notes:

- The Northern Free State high potential maize budget represents the cultivation of yellow maize under high potential conditions such as water table soils.
- Farm gate price for ground nuts is calculated according to assumptions based on the share of the crop that is graded according to selection grade (40/50-60/70 & 70/80), diverse and crush (human & oil).
- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize (higher potential) N:P:K – 100:16:14. Maize (normal potential) N:P:K – 88:16:8. Soybeans N:P:K – 10:10:10. Sunflower N:P:K – 45:7:10. Ground Nuts N:P:K – 15:15:15. Grain Sorghum N:P:K – 69:14:8.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

North West: Koster

Table 2.5: Income & cost budgets for maize, soybeans & sunflower for North West: Koster region - Dryland

North West: Koster				
Area				
Crop		Maize	Soybeans	Sunflower
Production System		Dryland	Dryland	Dryland
1) INCOME				
Yield: Deterministic	T/HA	4.75	2.00	2.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,552	R5,897	R5,979
Total deductions	R/TON	R227	R143	R292
- Transport differential	R/TON	R164	R-	R199
- Grade differential	R/TON	R-	R-	R-
- Marketing & Handling	R/TON	R63	R143	R93
Price premiums	R/TON	R-	R-	R-
Net Farm Gate Price	R/TON	R2,325	R5,754	R5,687
GROSS INCOME	R/HA	R11,043	R11,508	R11,373
2) VARIABLE EXPENDITURES				
Contracting	R/HA	R-	R-	R-
Crop insurance	R/HA	R233	R1,288	R330
Fertilizer	R/HA	R2,109	R942	R1,246
Lime	R/HA	R306	R-	R-
Seed	R/HA	R897	R654	R503
Fuel	R/HA	R894	R733	R729
Herbicide	R/HA	R1,043	R538	R183
Insecticide/Fungicide	R/HA	R42	R66	R17
Marketing costs	R/HA	R-	R-	R-
Repairs and maintenance	R/HA	R928	R512	R512
Casual labour	R/HA	R187	R-	R162
Aerial spray	R/HA	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R6,638	R4,735	R3,682
TOTAL VARIABLE EXPENDITURE	R/TON	R1,397	R2,367	R1,841
3.1) GROSS MARGIN:	R/HA	R4,406	R6,774	R7,692
3.2) GROSS MARGIN:	R/TON	R928	R3,387	R3,846
BREAK-EVEN YIELD	T/HA	2.85	0.82	0.65
BREAK-EVEN PRICE	R/TON	R1,397	R2,367	R1,841

Source: BFAP, GSA, NWK & Individual Farmers, 2020

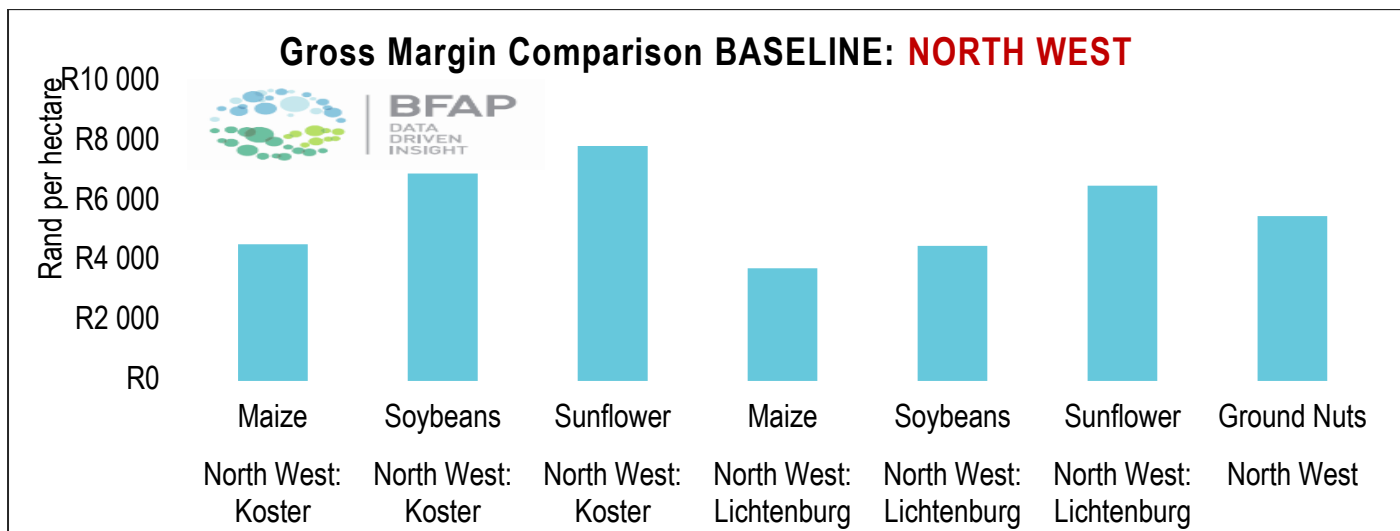


Figure 2.5: Gross margin comparison – Baseline: North West: Koster & Lichtenburg

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST KOSTER

		YIELD (T/HA)													
PRODUCERS PRICE		3.25		3.75		4.25		4.75		5.25		5.75		6.25	
R1,925	-R	382	R	581	R	1,543	R	2,506	R	3,468	R	4,431	R	5,393	R
R2,025	-R	57	R	956	R	1,968	R	2,981	R	3,993	R	5,006	R	6,018	R
R2,125	R	268	R	1,331	R	2,393	R	3,456	R	4,518	R	5,581	R	6,643	R
R2,225	R	593	R	1,706	R	2,818	R	3,931	R	5,043	R	6,156	R	7,268	R
R2,325	R	918	R	2,081	R	3,243	R	4,406	R	5,568	R	6,731	R	7,893	R
R2,425	R	1,243	R	2,456	R	3,668	R	4,881	R	6,093	R	7,306	R	8,518	R
R2,525	R	1,568	R	2,831	R	4,093	R	5,356	R	6,618	R	7,881	R	9,143	R
R2,625	R	1,893	R	3,206	R	4,518	R	5,831	R	7,143	R	8,456	R	9,768	R
R2,725	R	2,218	R	3,581	R	4,943	R	6,306	R	7,668	R	9,031	R	10,393	R

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST KOSTER

		YIELD (T/HA)													
PRODUCERS PRICE		1.25		1.50		1.75		2.00		2.25		2.50		2.75	
R5,354	R	1,958	R	3,297	R	4,635	R	5,974	R	7,312	R	8,651	R	9,989	R
R5,454	R	2,083	R	3,447	R	4,810	R	6,174	R	7,537	R	8,901	R	10,264	R
R5,554	R	2,208	R	3,597	R	4,985	R	6,374	R	7,762	R	9,151	R	10,539	R
R5,654	R	2,333	R	3,747	R	5,160	R	6,574	R	7,987	R	9,401	R	10,814	R
R5,754	R	2,458	R	3,897	R	5,335	R	6,774	R	8,212	R	9,651	R	11,089	R
R5,500	R	2,140	R	3,515	R	4,890	R	6,265	R	7,640	R	9,015	R	10,390	R
R5,750	R	2,453	R	3,890	R	5,328	R	6,765	R	8,203	R	9,640	R	11,078	R
R6,000	R	2,765	R	4,265	R	5,765	R	7,265	R	8,765	R	10,265	R	11,765	R
R6,250	R	3,078	R	4,640	R	6,203	R	7,765	R	9,328	R	10,890	R	12,453	R

SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST KOSTER

		YIELD (T/HA)													
PRODUCERS PRICE		1.25		1.50		1.75		2.00		2.25		2.50		2.75	
R5,287	R	2,927	R	4,248	R	5,570	R	6,892	R	8,213	R	9,535	R	10,857	R
R5,387	R	3,052	R	4,398	R	5,745	R	7,092	R	8,438	R	9,785	R	11,132	R
R5,487	R	3,177	R	4,548	R	5,920	R	7,292	R	8,663	R	10,035	R	11,407	R
R5,587	R	3,302	R	4,698	R	6,095	R	7,492	R	8,888	R	10,285	R	11,682	R
R5,687	R	3,427	R	4,848	R	6,270	R	7,692	R	9,113	R	10,535	R	11,957	R
R5,250	R	2,881	R	4,193	R	5,506	R	6,818	R	8,131	R	9,443	R	10,756	R
R5,500	R	3,193	R	4,568	R	5,943	R	7,318	R	8,693	R	10,068	R	11,443	R
R5,750	R	3,506	R	4,943	R	6,381	R	7,818	R	9,256	R	10,693	R	12,131	R
R6,000	R	3,818	R	5,318	R	6,818	R	8,318	R	9,818	R	11,318	R	12,818	R

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST KOSTER

PRICE (R/TON)														
YIELD	R	5,454	R	5,554	R	5,654	R	5,754	R	5,854	R	5,954	R	6,054
0.50	-R	6,413	-R	6,363	-R	6,313	-R	6,263	-R	6,213	-R	6,163	-R	6,113
0.75	-R	5,050	-R	4,975	-R	4,900	-R	4,825	-R	4,750	-R	4,675	-R	4,600
1.00	-R	3,686	-R	3,586	-R	3,486	-R	3,386	-R	3,286	-R	3,186	-R	3,086
1.25	-R	2,323	-R	2,198	-R	2,073	-R	1,948	-R	1,823	-R	1,698	-R	1,573
2.00	R	1,768	R	1,968	R	2,168	R	2,368	R	2,568	R	2,768	R	2,968
1.75	R	404	R	579	R	754	R	929	R	1,104	R	1,279	R	1,454
2.00	R	1,768	R	1,968	R	2,168	R	2,368	R	2,568	R	2,768	R	2,968
2.25	R	3,132	R	3,357	R	3,582	R	3,807	R	4,032	R	4,257	R	4,482
2.50	R	4,495	R	4,745	R	4,995	R	5,245	R	5,495	R	5,745	R	5,995

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 81:18:8. Soybeans N:P:K – 10:15:8. Sunflower N:P:K – 54:9:0.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

North West: Lichtenburg

Table 2.6: Income & cost budgets for maize, soybeans & sunflower for North West: Lichtenburg region - Dryland

North West: Lichtenburg					
Area		Maize	Soybeans	Sunflower	Ground Nuts
Crop					
Production System		Dryland	Dryland	Dryland	Dryland
1) INCOME					
Yield: Deterministic	T/HA	4.25	1.50	1.70	1.50
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,552	R5,897	R5,979	R8,875
Total deductions	R/TON	R280	R143	R325	R-
- Transport differential	R/TON	R217	R-	R232	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R63	R143	R93	R-
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,272	R5,754	R5,654	R8,875
GROSS INCOME	R/HA	R9,656	R8,631	R9,611	R13,313
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R-	R-	R-	R-
Crop insurance	R/HA	R145	R966	R270	R213
Fertilizer	R/HA	R1,888	R846	R878	R1,121
Lime	R/HA	R306	R-	R-	R214
Seed	R/HA	R811	R654	R503	R1,577
Fuel	R/HA	R882	R705	R717	R1,027
Herbicide	R/HA	R894	R538	R183	R727
Insecticide/Fungicide	R/HA	R17	R66	R17	R757
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R928	R512	R512	R1,179
Casual labour	R/HA	R187	R-	R162	R862
Aerial spray	R/HA	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-	R288
TOTAL VARIABLE EXPENDITURE	R/HA	R6,058	R4,288	R3,241	R7,963
TOTAL VARIABLE EXPENDITURE	R/TON	R1,425	R2,859	R1,907	R5,309
3.1) GROSS MARGIN:	R/HA	R3,597	R4,343	R6,370	R5,349
3.2) GROSS MARGIN:	R/TON	R846	R2,896	R3,747	R3,566
BREAK-EVEN YIELD	T/HA	2.67	0.75	0.57	0.90
BREAK-EVEN PRICE	R/TON	R1,425	R2,859	R1,907	R5,309

Source: BFAP, GSA, NWK & Individual Farmers, 2020

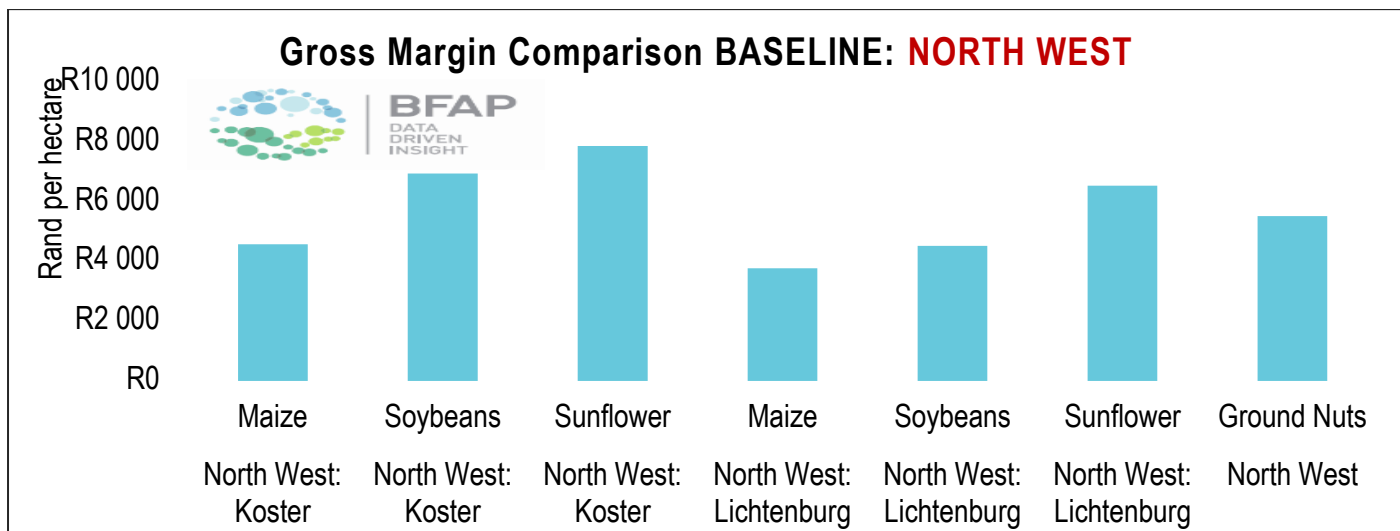


Figure 2.6: Gross margin comparison – Baseline: North West: Koster & Lichtenburg

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST LICHTENBURG

		YIELD (T/HA)													
PRODUCERS PRICE		2.75		3.25		3.75		4.25		4.75		5.25		5.75	
R1,872	-R	910	R	26	R	962	R	1,897	R	2,833	R	3,769	R	4,705	
R1,972	-R	635	R	351	R	1,337	R	2,322	R	3,308	R	4,294	R	5,280	
R2,072	-R	360	R	676	R	1,712	R	2,747	R	3,783	R	4,819	R	5,855	
R2,172	-R	85	R	1,001	R	2,087	R	3,172	R	4,258	R	5,344	R	6,430	
R2,272	R	190	R	1,326	R	2,462	R	3,597	R	4,733	R	5,869	R	7,005	
R2,372	R	465	R	1,651	R	2,837	R	4,022	R	5,208	R	6,394	R	7,580	
R2,472	R	740	R	1,976	R	3,212	R	4,447	R	5,683	R	6,919	R	8,155	
R2,572	R	1,015	R	2,301	R	3,587	R	4,872	R	6,158	R	7,444	R	8,730	
R2,672	R	1,290	R	2,626	R	3,962	R	5,297	R	6,633	R	7,969	R	9,305	

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST LICHTENBURG

		YIELD (T/HA)													
PRODUCERS PRICE		0.75		1.00		1.25		1.50		1.75		2.00		2.25	
R5,354	-R	272	R	1,066	R	2,405	R	3,743	R	5,082	R	6,420	R	7,759	
R5,454	-R	197	R	1,166	R	2,530	R	3,893	R	5,257	R	6,620	R	7,984	
R5,554	-R	122	R	1,266	R	2,655	R	4,043	R	5,432	R	6,820	R	8,209	
R5,654	-R	47	R	1,366	R	2,780	R	4,193	R	5,607	R	7,020	R	8,434	
R5,754	R	28	R	1,466	R	2,905	R	4,343	R	5,782	R	7,220	R	8,659	
R5,854	R	103	R	1,566	R	3,030	R	4,493	R	5,957	R	7,420	R	8,884	
R5,954	R	178	R	1,666	R	3,155	R	4,643	R	6,132	R	7,620	R	9,109	
R6,054	R	253	R	1,766	R	3,280	R	4,793	R	6,307	R	7,820	R	9,334	
R6,154	R	328	R	1,866	R	3,405	R	4,943	R	6,482	R	8,020	R	9,559	

SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST LICHTENBURG

		YIELD (T/HA)													
PRODUCERS PRICE		1.00		1.25		1.50		1.70		2.00		2.25		2.50	
R5,254	R	2,013	R	3,326	R	4,639	R	5,690	R	7,266	R	8,580	R	9,893	
R5,354	R	2,113	R	3,451	R	4,789	R	5,860	R	7,466	R	8,805	R	10,143	
R5,454	R	2,213	R	3,576	R	4,939	R	6,030	R	7,666	R	9,030	R	10,393	
R5,554	R	2,313	R	3,701	R	5,089	R	6,200	R	7,866	R	9,255	R	10,643	
R5,654	R	2,413	R	3,826	R	5,239	R	6,370	R	8,066	R	9,480	R	10,893	
R5,754	R	2,513	R	3,951	R	5,389	R	6,540	R	8,266	R	9,705	R	11,143	
R5,854	R	2,613	R	4,076	R	5,539	R	6,710	R	8,466	R	9,930	R	11,393	
R5,954	R	2,713	R	4,201	R	5,689	R	6,880	R	8,666	R	10,155	R	11,643	
R6,054	R	2,813	R	4,326	R	5,839	R	7,050	R	8,866	R	10,380	R	11,893	

GROUND NUTS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST

		YIELD (T/HA)													
PRODUCERS PRICE		0.75		1.00		1.25		1.50		1.75		2.00		2.25	
R8,475	-R	932	R	1,412	R	3,755	R	6,099	R	8,443	R	10,787	R	13,130	
R8,575	-R	857	R	1,512	R	3,880	R	6,249	R	8,618	R	10,987	R	13,355	
R8,675	-R	782	R	1,612	R	4,005	R	6,399	R	8,793	R	11,187	R	13,580	
R8,775	-R	707	R	1,712	R	4,130	R	6,549	R	8,968	R	11,387	R	13,805	
R8,875	-R	632	R	1,812	R	4,255	R	6,699	R	9,143	R	11,587	R	14,030	
R8,975	-R	557	R	1,912	R	4,380	R	6,849	R	9,318	R	11,787	R	14,255	
R9,075	-R	482	R	2,012	R	4,505	R	6,999	R	9,493	R	11,987	R	14,480	
R9,175	-R	407	R	2,112	R	4,630	R	7,149	R	9,668	R	12,187	R	14,705	
R9,275	-R	332	R	2,212	R	4,755	R	7,299	R	9,843	R	12,387	R	14,930	

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST LICHTENBURG

		PRICE (R/TON)													
YIELD		R	5,454	R	5,554	R	5,654	R	5,754	R	5,854	R	5,954	R	6,054
0.50	-R	5,158	-R	5,108	-R	5,058	-R	5,008	-R	4,958	-R	4,908	-R	4,858	
0.75	-R	3,795	-R	3,720	-R	3,645	-R	3,570	-R	3,495	-R	3,420	-R	3,345	
1.00	-R	2,431	-R	2,331	-R	2,231	-R	2,131	-R	2,031	-R	1,931	-R	1,831	
1.25	-R	1,068	-R	943	-R	818	-R	693	-R	568	-R	443	-R	318	
1.50	R	296	R	446	R	596	R	746	R	896	R	1,046	R	1,196	
1.75	R	1,659	R	1,834	R	2,009	R	2,184	R	2,359	R	2,534	R	2,709	
2.00	R	3,023	R	3,223	R	3,423	R	3,623	R	3,823	R	4,023	R	4,223	
2.25	R	4,387	R	4,612	R	4,837	R	5,062	R	5,287	R	5,512	R	5,737	
2.50	R	5,750	R	6,000	R	6,250	R	6,500	R	6,750	R	7,000	R	7,250	

Notes:

- Farm gate price for ground nuts is calculated according to assumptions based on the share of the crop that is graded according to selection grade (40/50-60/70 & 70/80), diverse and crush (human & oil).
- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 72:16:8. Soybeans N:P:K – 10:12:8. Sunflower N:P:K – 40:9:0. Ground Nuts N:P:K – 15:15:15.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

2020/21 INCOME & COST BUDGETS – IRRIGATION

Northern Cape

Table 3.1: Income & cost budgets for maize, soybeans, ground nuts & sunflower (oil) for Northern Cape - Irrigation

Northern Cape: Irrigation					
Area		Maize	Soybeans	Ground Nuts	Sunflower
Crop		Irrigation	Irrigation	Irrigation	Irrigation
Production System					
1) INCOME					
Yield: Deterministic	T/HA	13.50	4.00	3.50	3.20
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897	R9,930	R5,979
Total deductions	R/TON	R348	R143	R63	R461
- Transport differential	R/TON	R285	R-	R-	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R63	R143	R63	R461
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,285	R5,754	R9,867	R5,518
GROSS INCOME	R/HA	R30,844	R23,017	R36,035	R17,657
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R1,470	R1,470	R3,520	R1,470
Crop insurance	R/HA	R308	R1,381	R360	R883
Fertilizer	R/HA	R8,564	R5,234	R6,675	R4,597
Lime	R/HA	R653	R-	R790	R-
Seed	R/HA	R4,975	R1,881	R3,443	R811
Fuel	R/HA	R926	R647	R1,010	R985
Herbicide	R/HA	R663	R382	R1,110	R144
Insecticide/Fungicide	R/HA	R2,397	R1,582	R3,808	R255
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R526	R252	R686	R696
Casual labour	R/HA	R-	R-	R168	R-
Aerial spray	R/HA	R450	R-	R-	R-
Irrigation Electricity	R/HA	R3,733	R3,733	R3,841	R2,651
Water	R/HA	R1,180	R1,180	R1,214	R838
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R835	R820	R2,920	R820
TOTAL VARIABLE EXPENDITURE	R/HA	R26,680	R18,561	R29,546	R14,150
TOTAL VARIABLE EXPENDITURE	R/TON	R1,976	R4,640	R8,442	R4,422
3.1) GROSS MARGIN:	R/HA	R4,164	R4,455	R6,489	R3,506
3.2) GROSS MARGIN:	R/TON	R308	R1,114	R1,854	R1,096
BREAK-EVEN YIELD	T/HA	11.68	3.23	2.99	2.56
BREAK-EVEN PRICE	R/TON	R1,976	R4,640	R8,442	R4,422

Source: BFAP, GSA & GWK, 2020

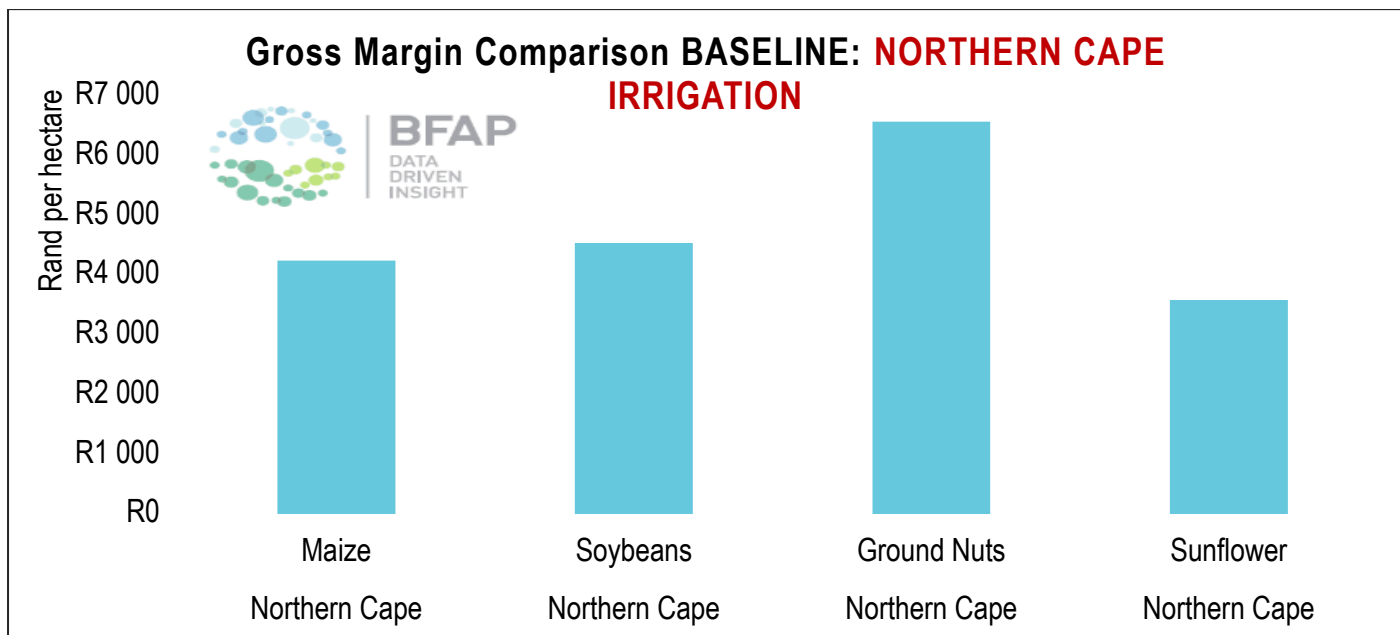


Figure 3.1: Gross margin comparison – Baseline: Northern Cape Irrigation

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION															
YIELD (T/HA)															
PRODUCERS PRICE		12.00		12.50		13.00		13.50		14.00		14.50		15.00	
R1,885	-R	4,063	-R	3,121	-R	2,178	-R	1,236	-R	294	R	649	R	1,591	
R1,985	-R	2,863	-R	1,871	-R	878	R	114	R	1,106	R	2,099	R	3,091	
R2,085	-R	1,663	-R	621	R	422	R	1,464	R	2,506	R	3,549	R	4,591	
R2,185	-R	463	R	629	R	1,722	R	2,814	R	3,906	R	4,999	R	6,091	
R2,285	R	737	R	1,879	R	3,022	R	4,164	R	5,306	R	6,449	R	7,591	
R2,385	R	1,937	R	3,129	R	4,322	R	5,514	R	6,706.30	R	7,899	R	9,091	
R2,485	R	3,137	R	4,379	R	5,622	R	6,864	R	8,106	R	9,349	R	10,591	
R2,585	R	4,337	R	5,629	R	6,922	R	8,214	R	9,506	R	10,799	R	12,091	
R2,685	R	5,537	R	6,879	R	8,222	R	9,564	R	10,906	R	12,249	R	13,591	

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION															
YIELD (T/HA)															
PRODUCERS PRICE		3.25		3.50		3.75		4.00		4.25		4.50		4.75	
R5,354	-R	1,160	R	178	R	1,517	R	2,855	R	4,194	R	5,532	R	6,871	
R5,454	-R	835	R	528	R	1,892	R	3,255	R	4,619	R	5,982	R	7,346	
R5,554	-R	510	R	878	R	2,267	R	3,655	R	5,044	R	6,432	R	7,821	
R5,654	-R	185	R	1,228	R	2,642	R	4,055	R	5,469	R	6,882	R	8,296	
R5,754	R	140	R	1,578	R	3,017	R	4,455	R	5,894	R	7,332	R	8,771	
R5,854	R	465	R	1,928	R	3,392	R	4,855	R	6,319	R	7,782	R	9,246	
R5,954	R	790	R	2,278	R	3,767	R	5,255	R	6,744	R	8,232	R	9,721	
R6,054	R	1,115	R	2,628	R	4,142	R	5,655	R	7,169	R	8,682	R	10,196	
R6,154	R	1,440	R	2,978	R	4,517	R	6,055	R	7,594	R	9,132	R	10,671	

GROUND NUTS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION

		YIELD (T/HA)											
PRODUCERS PRICE		2.75		3.00		3.25		3.50		4.00		4.50	
R9,467	-R	1,448.78	R	1,105	R	3,660	R	6,214	R	11,322	R	16,431	R
R9,567	-R	1,174	R	1,405	R	3,985	R	6,564	R	11,722	R	16,881	R
R9,667	-R	899	R	1,705	R	4,310	R	6,914	R	12,122	R	17,331	R
R9,767	-R	624	R	2,005	R	4,635	R	7,264	R	12,522	R	17,781	R
R9,867	-R	349	R	2,305	R	4,960	R	7,614	R	12,922	R	18,231	R
R9,967	-R	74	R	2,605	R	5,285	R	7,964	R	13,322	R	18,681	R
R10,067	R	201	R	2,905	R	5,610	R	8,314	R	13,722	R	19,131	R
R10,167	R	476	R	3,205	R	5,935	R	8,664	R	14,122	R	19,581	R
R10,267	R	751	R	3,505	R	6,260	R	9,014	R	14,522	R	20,031	R

SUNFLOWER OIL SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION

		YIELD (T/HA)											
PRODUCERS PRICE		2.45		2.70		2.95		3.20		3.70		4.20	
R5,118	-R	1,612	-R	333	R	947	R	2,226	R	4,785	R	7,344	R
R5,218	-R	1,367	-R	63	R	1,242	R	2,546	R	5,155	R	7,764	R
R5,318	-R	1,122	R	207	R	1,537	R	2,866	R	5,525	R	8,184	R
R5,418	-R	877	R	477	R	1,832	R	3,186	R	5,895	R	8,604	R
R5,518	-R	632	R	747	R	2,127	R	3,506	R	6,265	R	9,024	R
R5,618	-R	387	R	1,017	R	2,422	R	3,826	R	6,635	R	9,444	R
R5,718	-R	142	R	1,287	R	2,717	R	4,146	R	7,005	R	9,864	R
R5,818	R	103	R	1,557	R	3,012	R	4,466	R	7,375	R	10,284	R
R5,918	R	348	R	1,827	R	3,307	R	4,786	R	7,745	R	10,704	R

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION

		PRICE (R/TON)											
YIELD		5,454		5,554		5,654		5,754		5,854		5,954	
3.00	-R	6,363	-R	6,063	-R	5,763	-R	5,463	-R	5,163	-R	4,863	-R
3.25	-R	4,999	-R	4,674	-R	4,349	-R	4,024	-R	3,699	-R	3,374	-R
3.50	-R	3,636	-R	3,286	-R	2,936	-R	2,586	-R	2,236	-R	1,886	-R
3.75	-R	2,272	-R	1,897	-R	1,522	-R	1,147	-R	772	-R	397	-R
4.00	-R	909	-R	509	-R	109	R	291	R	691	R	1,091	R
4.25	R	455	R	880	R	1,305	R	1,730	R	2,155	R	2,580	R
4.50	R	1,818	R	2,268	R	2,718	R	3,168	R	3,618	R	4,068	R
4.75	R	3,182	R	3,657	R	4,132	R	4,607	R	5,082	R	5,557	R
5.00	R	4,546	R	5,046	R	5,546	R	6,046	R	6,546	R	7,046	R

Notes:

- Farm gate price for ground nuts is calculated according to assumptions based on the share of the crop that is graded according to selection grade (40/50-60/70 & 70/80), diverse and crush (human & oil).
- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 286:52:80. Soybeans N:P:K – 120:36:50. Ground nuts N:P:K – 160:45:60. Sunflower N:P:K – 100:30:50.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

KwaZulu-Natal: Bergville

Table 3.2: Income & cost budgets for maize & soybeans for KwaZulu-Natal: Bergvriervier - Irrigation

KwaZulu-Natal: Bergvriervier			
Area		Maize	Soybeans
Crop		Irrigation	Irrigation
Production System			
1) INCOME			
Yield: Deterministic	T/HA	12.00	4.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897
Total deductions	R/TON	R395	R139
- Transport differential	R/TON	R335	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R60	R139
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2,238	R5,758
GROSS INCOME	R/HA	R26,853	R23,033
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R-	R-
Crop insurance	R/HA	R1,020	R3,225
Fertilizer	R/HA	R6,022	R2,230
Lime	R/HA	R613	R-
Seed	R/HA	R3,980	R1,881
Fuel	R/HA	R1,220	R1,227
Herbicide	R/HA	R1,192	R1,387
Insecticide/Fungicide	R/HA	R544	R957
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R855	R933
Casual labour	R/HA	R205	R-
Aerial spray	R/HA	R-	R-
Irrigation Electricity	R/HA	R2,135	R1,817
Water	R/HA	R2,018	R1,717
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R554	R554
TOTAL VARIABLE EXPENDITURE	R/HA	R20,358	R15,929
TOTAL VARIABLE EXPENDITURE	R/TON	R1,696	R3,982
3.1) GROSS MARGIN:	R/HA	R6,495	R7,104
3.2) GROSS MARGIN:	R/TON	R541	R1,776
BREAK-EVEN YIELD	T/HA	9.10	2.77
BREAK-EVEN PRICE	R/TON	R1,696	R3,982

Source: BFAP, GSA & Individual Farmers, 2020

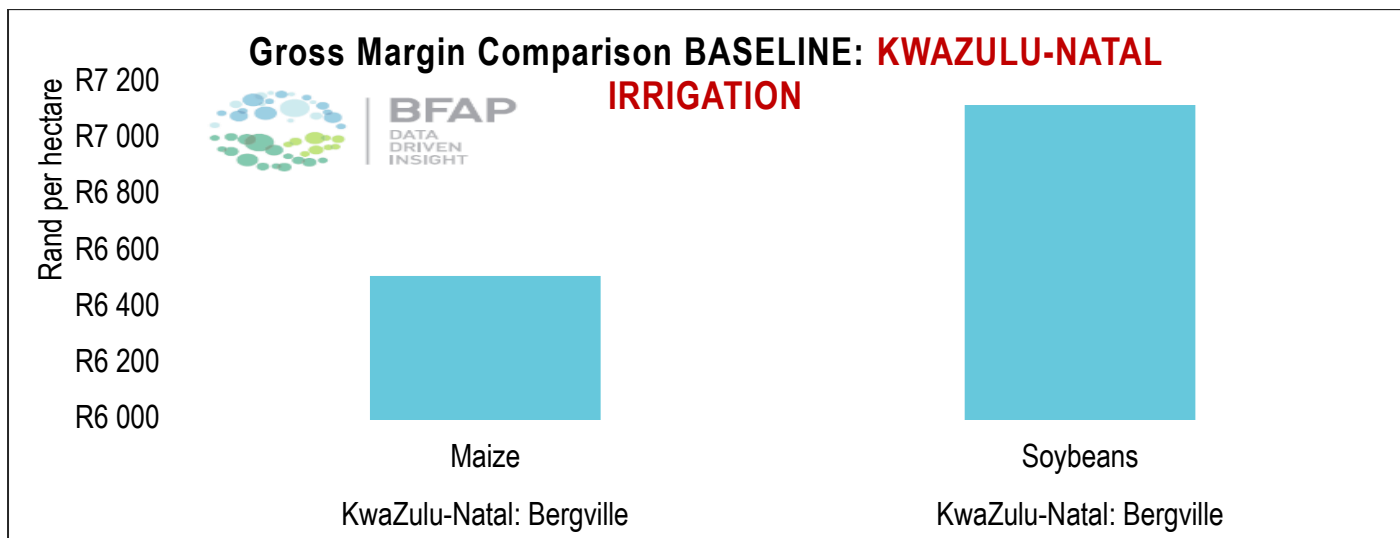


Figure 3.2: Gross margin comparison – Baseline: KwaZulu-Natal: Berggrivier

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): KWAZULU-NATAL:BERGVILLE

		YIELD (T/HA)													
PRODUCERS PRICE		10.50		11.00		11.50		12.00		12.50		13.00		13.50	
R1,838	-R	1,061	-R	143	R	776	R	1,695	R	2,614	R	3,533	R	4,452	
R1,938	-R	11	R	957	R	1,926	R	2,895	R	3,864	R	4,833	R	5,802	
R2,038	R	1,039	R	2,057	R	3,076	R	4,095	R	5,114	R	6,133	R	7,152	
R2,138	R	2,089	R	3,157	R	4,226	R	5,295	R	6,364	R	7,433	R	8,502	
R2,238	R	3,139	R	4,257	R	5,376	R	6,495	R	7,614	R	8,733	R	9,852	
R2,338	R	4,189	R	5,357	R	6,526	R	7,695	R	8,864.00	R	10,033	R	11,202	
R2,438	R	5,239	R	6,457	R	7,676	R	8,895	R	10,114	R	11,333	R	12,552	
R2,538	R	6,289	R	7,557	R	8,826	R	10,095	R	11,364	R	12,633	R	13,902	
R2,638	R	7,339	R	8,657	R	9,976	R	11,295	R	12,614	R	13,933	R	15,252	

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): KWAZULU-NATAL:BERGVILLE

		YIELD (T/HA)													
PRODUCERS PRICE		3.25		3.50		3.75		4.00		4.25		4.50		4.75	
R5,358	R	1,485	R	2,825	R	4,164	R	5,504	R	6,843	R	8,183	R	9,523	
R5,458	R	1,810	R	3,175	R	4,539	R	5,904	R	7,268	R	8,633	R	9,998	
R5,558	R	2,135	R	3,525	R	4,914	R	6,304	R	7,693	R	9,083	R	10,473	
R5,658	R	2,460	R	3,875	R	5,289	R	6,704	R	8,118	R	9,533	R	10,948	
R5,758	R	2,785	R	4,225	R	5,664	R	7,104	R	8,543	R	9,983	R	11,423	
R5,858	R	3,110	R	4,575	R	6,039	R	7,504	R	8,968	R	10,433	R	11,898	
R5,958	R	3,435	R	4,925	R	6,414	R	7,904	R	9,393	R	10,883	R	12,373	
R6,058	R	3,760	R	5,275	R	6,789	R	8,304	R	9,818	R	11,333	R	12,848	
R6,158	R	4,085	R	5,625	R	7,164	R	8,704	R	10,243	R	11,783	R	13,323	

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): KWAZULU-NATAL:BERGVILLE

		PRICE (R/TON)													
YIELD		5,458		5,558		5,658		5,758		5,858		5,958		6,058	
3.00	-R	6,049	-R	5,749	-R	5,449	-R	5,149	-R	4,849	-R	4,549	-R	4,249	
3.25	-R	4,685	-R	4,360	-R	4,035	-R	3,710	-R	3,385	-R	3,060	-R	2,735	
3.50	-R	3,320	-R	2,970	-R	2,620	-R	2,270	-R	1,920	-R	1,570	-R	1,220	
3.75	-R	1,956	-R	1,581	-R	1,206	-R	831	-R	456	-R	81	R	294	
4.00	-R	591	-R	191	R	209	R	609	R	1,009	R	1,409	R	1,809	
4.25	R	773	R	1,198	R	1,623	R	2,048	R	2,473	R	2,898	R	3,323	
4.50	R	2,138	R	2,588	R	3,038	R	3,488	R	3,938	R	4,388	R	4,838	
4.75	R	3,502	R	3,977	R	4,452	R	4,927	R	5,402	R	5,877	R	6,352	
5.00	R	4,867	R	5,367	R	5,867	R	6,367	R	6,867	R	7,367	R	7,867	

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 212:49:56. Soybeans N:P:K – 20:36:40.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

North-West

Table 3.3: Income & cost budgets for maize, soybeans, sunflower & sorghum for North West: Brits region - Irrigation

Area	North West: Brits / Northam / Koedoeskop				
Crop		Maize	Soybeans	Sunflower	Sorghum
Production System		Irrigation	Irrigation	Irrigation	Irrigation
1) INCOME					
Yield: Deterministic	T/HA	12.00	3.80	3.00	7.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897	R5,979	R2,926
Total deductions	R/TON	R229	R143	R258	R63
- Transport differential	R/TON	R166	R-	R195	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R63	R143	R63	R63
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2,404	R5,754	R5,721	R2,863
GROSS INCOME	R/HA	R28,845	R21,866	R17,162	R20,044
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R850	R850	R-	R-
Crop insurance	R/HA	R981	R1,203	R412	R510
Fertilizer	R/HA	R6,123	R2,160	R1,808	R3,323
Lime	R/HA	R510	R-	R-	R332
Seed	R/HA	R3,869	R1,881	R973	R704
Fuel	R/HA	R1,117	R659	R964	R1,061
Herbicide	R/HA	R895	R1,090	R243	R714
Insecticide/Fungicide	R/HA	R502	R66	R681	R836
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R595	R521	R513	R670
Casual labour	R/HA	R205	R-	R109	R139
Aerial spray	R/HA	R-	R-	R-	R220
Irrigation Electricity	R/HA	R3,231	R2,526	R2,056	R2,644
Water	R/HA	R2,229	R1,743	R1,419	R1,824
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R388	R411	R388	R411
TOTAL VARIABLE EXPENDITURE	R/HA	R21,496	R13,111	R9,566	R13,387
TOTAL VARIABLE EXPENDITURE	R/TON	R1,791	R3,450	R3,189	R1,912
3.1) GROSS MARGIN:	R/HA	R7,349	R8,755	R7,596	R6,657
3.2) GROSS MARGIN:	R/TON	R612	R2,304	R2,532	R951
BREAK-EVEN YIELD	T/HA	8.94	2.28	1.67	4.67
BREAK-EVEN PRICE	R/TON	R1,791	R3,450	R3,189	R1,912

Source: BFAP, GSA, NWK & Individual Farmers, 2020

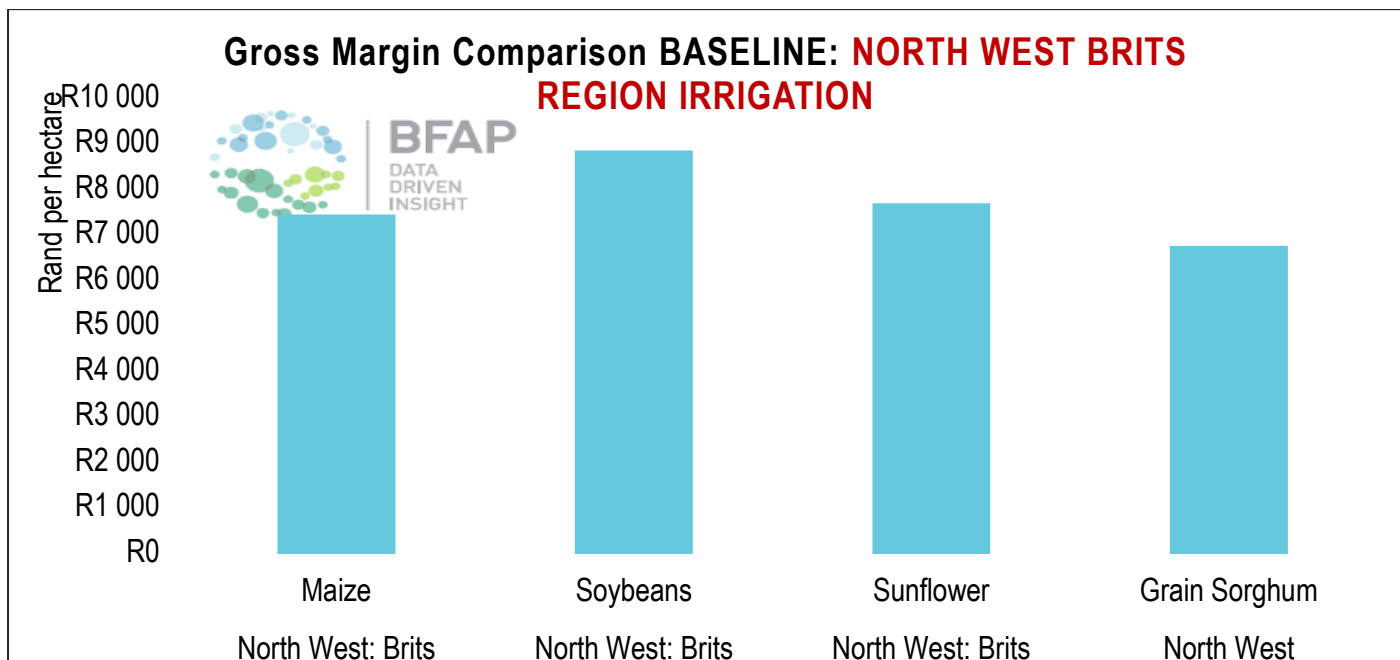


Figure 3.3: Gross margin comparison – Baseline: North West: Brits Region

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST BRITS										
YIELD (T/HA)										
PRODUCERS PRICE	10.50	11.00	11.50	12.00	12.50	13.00	13.50			
R2,004	R 456	R 546	R 1,548	R 2,549	R 3,551	R 4,553	R 5,555			
R2,104	R 594	R 1,646	R 2,698	R 3,749	R 4,801	R 5,853	R 6,905			
R2,204	R 1,644	R 2,746	R 3,848	R 4,949	R 6,051	R 7,153	R 8,255			
R2,304	R 2,694	R 3,846	R 4,998	R 6,149	R 7,301	R 8,453	R 9,605			
R2,404	R 3,744	R 4,946	R 6,148	R 7,349	R 8,551	R 9,753	R 10,955			
R2,504	R 4,794	R 6,046	R 7,298	R 8,549	R 9,801.31	R 11,053	R 12,305			
R2,604	R 5,844	R 7,146	R 8,448	R 9,749	R 11,051	R 12,353	R 13,655			
R2,704	R 6,894	R 8,246	R 9,598	R 10,949	R 12,301	R 13,653	R 15,005			
R2,804	R 7,944	R 9,346	R 10,748	R 12,149	R 13,551	R 14,953	R 16,355			

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST BRITS										
YIELD (T/HA)										
PRODUCERS PRICE	3.00	3.25	3.50	3.80	4.00	4.25	4.50			
R5,354	R 2,952	R 4,290	R 5,629	R 7,235	R 8,306	R 9,645	R 10,983			
R5,454	R 3,252	R 4,615	R 5,979	R 7,615	R 8,706	R 10,070	R 11,433			
R5,554	R 3,552	R 4,940	R 6,329	R 7,995	R 9,106	R 10,495	R 11,883			
R5,654	R 3,852	R 5,265	R 6,679	R 8,375	R 9,506	R 10,920	R 12,333			
R5,754	R 4,152	R 5,590	R 7,029	R 8,755	R 9,906	R 11,345	R 12,783			
R5,854	R 4,452	R 5,915	R 7,379	R 9,135	R 10,306	R 11,770	R 13,233			
R5,954	R 4,752	R 6,240	R 7,729	R 9,515	R 10,706	R 12,195	R 13,683			
R6,054	R 5,052	R 6,565	R 8,079	R 9,895	R 11,106	R 12,620	R 14,133			
R6,154	R 5,352	R 6,890	R 8,429	R 10,275	R 11,506	R 13,045	R 14,583			

SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST BRITS

		YIELD (T/HA)									
PRODUCERS PRICE		2.30		2.55		2.80		3.00		3.30	
		R	R	R	R	R	R	R	R	R	R
R5,321	R	2,672	R	4,002	R	5,332	R	6,396	R	7,993	R
R5,421	R	2,902	R	4,257	R	5,612	R	6,696	R	8,323	R
R5,521	R	3,132	R	4,512	R	5,892	R	6,996	R	8,653	R
R5,621	R	3,362	R	4,767	R	6,172	R	7,296	R	8,983	R
R5,721	R	3,592	R	5,022	R	6,452	R	7,596	R	9,313	R
R5,821	R	3,822	R	5,277	R	6,732	R	7,896	R	9,643	R
R5,921	R	4,052	R	5,532	R	7,012	R	8,196	R	9,973	R
R6,021	R	4,282	R	5,787	R	7,292	R	8,496	R	10,303	R
R6,121	R	4,512	R	6,042	R	7,572	R	8,796	R	10,633	R

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST BRITS

		PRICE (R/TON)									
YIELD		R	R	R	R	R	R	R	R	R	R
2.75	-R	5,461	-R	5,186	-R	4,911	-R	4,636	-R	4,361	-R
3.00	-R	4,098	-R	3,798	-R	3,498	-R	3,198	-R	2,898	-R
3.25	-R	2,734	-R	2,409	-R	2,084	-R	1,759	-R	1,434	-R
3.50	-R	1,370	-R	1,020	-R	670	-R	320	R	30	R
3.80	R	266	R	646	R	1,026	R	1,406	R	1,786	R
4.00	R	1,357	R	1,757	R	2,157	R	2,557	R	2,957	R
4.25	R	2,720	R	3,145	R	3,570	R	3,995	R	4,420	R
4.50	R	4,084	R	4,534	R	4,984	R	5,434	R	5,884	R
4.75	R	5,447	R	5,922	R	6,397	R	6,872	R	7,347	R

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 240:42:48. Soybeans N:P:K – 14:36:42. Sunflower N:P:K – 60:15:24. Grain sorghum N:P:K – 140:25:28.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

Limpopo

Table 3.4: Income & cost budgets for maize & soybeans for Limpopo: Loskop region - Irrigation

Area		Limpopo: Loskop	
Crop		Maize	Soybeans
Production System		Irrigation	Irrigation
1) INCOME			
Yield: Deterministic	T/HA	12.00	4.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2021	R/TON	R2,633	R5,897
Total deductions	R/TON	R334	R143
- Transport differential	R/TON	R271	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R63	R143
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2,299	R5,754
GROSS INCOME	R/HA	R27,585	R23,017
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R850	R850
Crop insurance	R/HA	R938	R1,266
Fertilizer	R/HA	R6,123	R2,267
Lime	R/HA	R653	R-
Seed	R/HA	R3,869	R1,881
Fuel	R/HA	R1,117	R644
Herbicide	R/HA	R895	R1,090
Insecticide/Fungicide	R/HA	R502	R66
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R595	R521
Casual labour	R/HA	R205	R-
Aerial spray	R/HA	R-	R-
Irrigation Electricity	R/HA	R4,296	R3,092
Water	R/HA	R1,011	R728
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R388	R411
TOTAL VARIABLE EXPENDITURE	R/HA	R21,442	R12,816
TOTAL VARIABLE EXPENDITURE	R/TON	R1,787	R3,204
3.1) GROSS MARGIN:			
	R/HA	R6,143	R10,201
3.2) GROSS MARGIN:			
	R/TON	R512	R2,550
BREAK-EVEN YIELD			
	T/HA	9.33	2.23
BREAK-EVEN PRICE			
	R/TON	R1,787	R3,204

Source: BFAP, GSA & Individual Farmers, 2020

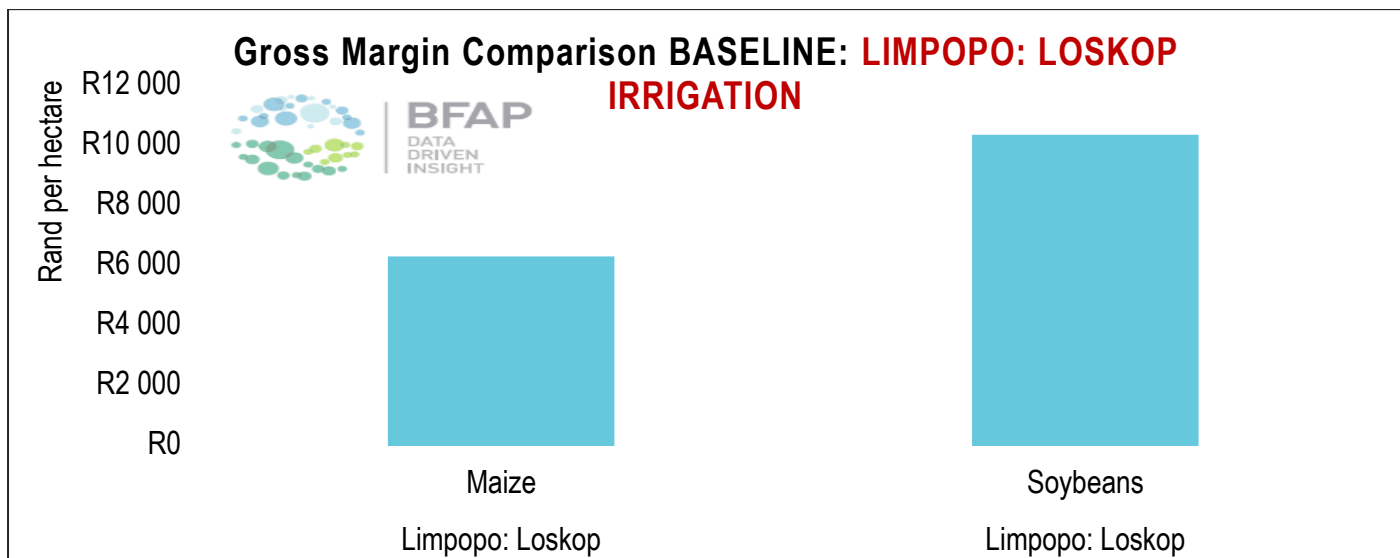


Figure 3.4: Gross margin comparison – Baseline: Limpopo: Loskop Region

MAIZE SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): LOSKOP AREA															
YIELD (T/HA)															
PRODUCERS PRICE		10.50		11.00		11.50		12.00		12.50		13.00		13.50	
	R1,899	-R	1,505	-R	556	R	394	R	1,343	R	2,292	R	3,242	R	4,191
	R1,999	-R	455	R	544	R	1,544	R	2,543	R	3,542	R	4,542	R	5,541
	R2,099	R	595	R	1,644	R	2,694	R	3,743	R	4,792	R	5,842	R	6,891
	R2,199	R	1,645	R	2,744	R	3,844	R	4,943	R	6,042	R	7,142	R	8,241
	R2,299	R	2,695	R	3,844	R	4,994	R	6,143	R	7,292	R	8,442	R	9,591
	R2,399	R	3,745	R	4,944	R	6,144	R	7,343	R	8,542	R	9,742	R	10,941
	R2,499	R	4,795	R	6,044	R	7,294	R	8,543	R	9,792	R	11,042	R	12,291
	R2,599	R	5,845	R	7,144	R	8,444	R	9,743	R	11,042	R	12,342	R	13,641
	R2,699	R	6,895	R	8,244	R	9,594	R	10,943	R	12,292	R	13,642	R	14,991

SOYBEANS SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): LIMPOPO: LOSKOP AREA														
YIELD (T/HA)														
PRODUCERS PRICE		3.25		3.50		3.75		4.00		4.25		4.50		4.75
R5,354	R	4,585	R	5,924	R	7,262	R	8,601	R	9,940	R	11,278	R	12,617
R5,454	R	4,910	R	6,274	R	7,637	R	9,001	R	10,365	R	11,728	R	13,092
R5,554	R	5,235	R	6,624	R	8,012	R	9,401	R	10,790	R	12,178	R	13,567
R5,654	R	5,560	R	6,974	R	8,387	R	9,801	R	11,215	R	12,628	R	14,042
R5,754	R	5,885	R	7,324	R	8,762	R	10,201	R	11,640	R	13,078	R	14,517
R5,854	R	6,210	R	7,674	R	9,137	R	10,601	R	12,065	R	13,528	R	14,992
R5,954	R	6,535	R	8,024	R	9,512	R	11,001	R	12,490	R	13,978	R	15,467
R6,054	R	6,860	R	8,374	R	9,887	R	11,401	R	12,915	R	14,428	R	15,942
R6,154	R	7,185	R	8,724	R	10,262	R	11,801	R	13,340	R	14,878	R	16,417

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): LIMPOPO: LOSKOP AREA														
PRICE (R/TON)														
YIELD	R	5,454	R	5,554	R	5,654	R	5,754	R	5,854	R	5,954	R	6,054
3.00	-R	2,596	-R	2,296	-R	1,996	-R	1,696	-R	1,396	-R	1,096	-R	796
3.25	-R	1,233	-R	908	-R	583	-R	258	R	67	R	392	R	717
3.50	R	131	R	481	R	831	R	1,181	R	1,531	R	1,881	R	2,231
3.75	R	1,494	R	1,869	R	2,244	R	2,619	R	2,994	R	3,369	R	3,744
4.00	R	2,858	R	3,258	R	3,658	R	4,058	R	4,458	R	4,858	R	5,258
4.25	R	4,222	R	4,647	R	5,072	R	5,497	R	5,922	R	6,347	R	6,772
4.50	R	5,585	R	6,035	R	6,485	R	6,935	R	7,385	R	7,835	R	8,285
4.75	R	6,949	R	7,424	R	7,899	R	8,374	R	8,849	R	9,324	R	9,799
5.00	R	8,312	R	8,812	R	9,312	R	9,812	R	10,312	R	10,812	R	11,312

Notes:

- The cost items reflect the input allocation based on the target yield for the respective crops.
- Although some expenditure items are zero, it is reflected in the budgets to allow for individual inclusion.
- Fertiliser assumptions (kg/ha): Maize N:P:K – 240:42:48. Soybeans N:P:K – 14:38:45.
- Other macro- & microelements such as calcium, magnesium and zinc are included in the fertiliser costs.
- The cost of fuel includes pre-harvest and harvesting costs with the assumption that own machinery is used.
- The cost for soybean seed reflects a combination of own- and purchased seed.
- There will be large fluctuations for insurance cost (hail) based on the associated risk in respective areas. It is advised that producers adjust this cost based on their individual premiums.
- It is important to note that overhead costs are not included and should be accounted for.

Summary: 2020/21 Income & Cost Budgets

Figures 4.1 - 4.4 provide a summary on gross margins performance of dryland and irrigated crops over the period from 2018 (adjusted to account for actual yields) to 2022 (projected).

Across the 24 dryland crops in 7 agro-ecological regions, an average gross margin of R5,088 per hectare is projected for the 2020/21 production season, approximately 21% lower compared to the 2019/20 production season, however 65% higher compared to the 2018/19 production season.

For dryland crops, direct costs are projected to move relatively sideways, driven mainly by a decrease in the cost for fuel and fertilisers. High crop prices coupled with higher yields over most parts of the summer crop producing regions in 2019/20 have resulted in robust gross margins levels across all dryland crops. For the 2020/21 season, it is projected that on average, maize gross margins will decrease from 2019/20 levels (+33% lower). Oilseeds is projected marginally lower, however, substantially higher opposed to maize (sunflower lower by 5% and soybeans by 11%). For irrigated crops, maize gross margin is projected to decline by an average of 35% in 2020/21 (relative to 2019/20 levels). The cultivation of soybeans under irrigation is projected to outperform maize and sunflower in the 2020/21 production season.

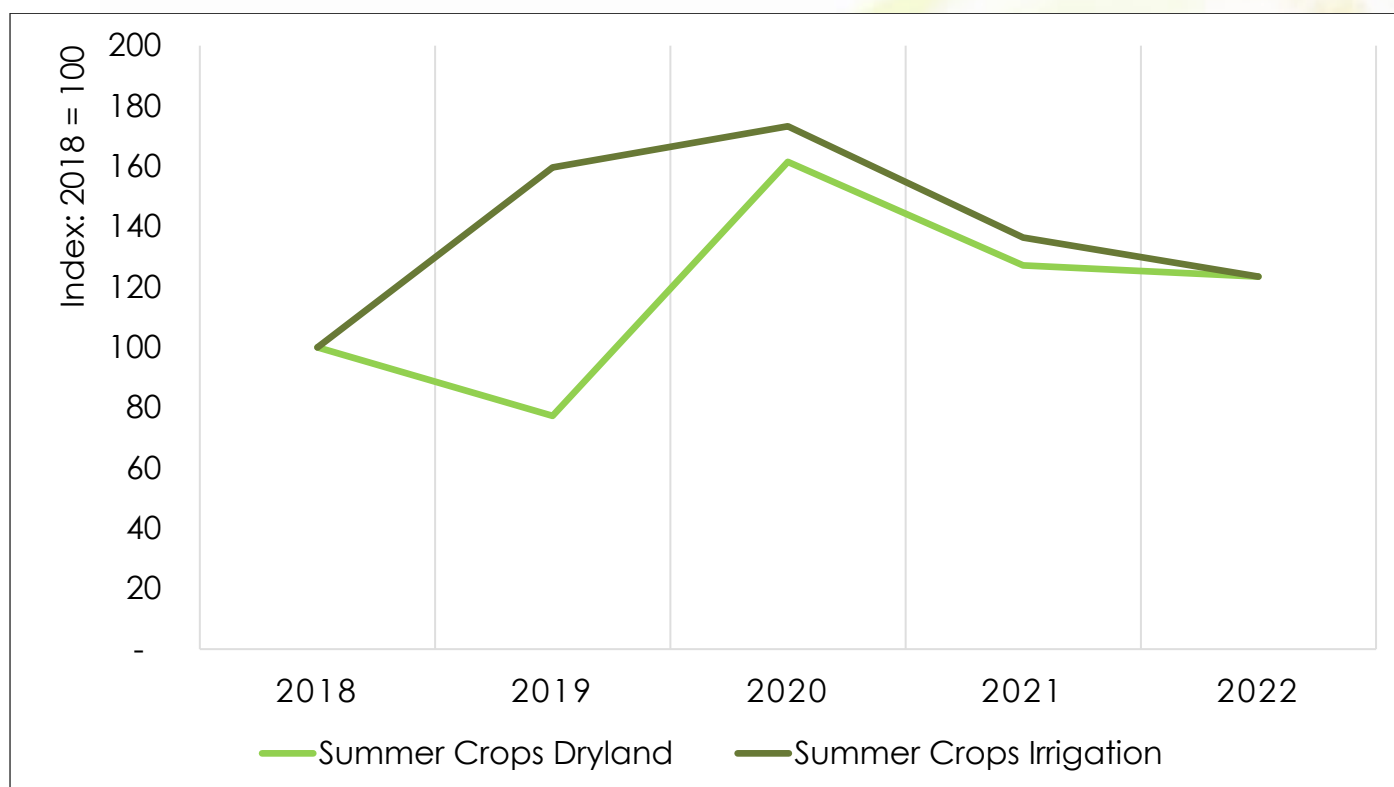


Figure 4.1: Gross margin index between dryland & irrigated summer crops: 2018-2022

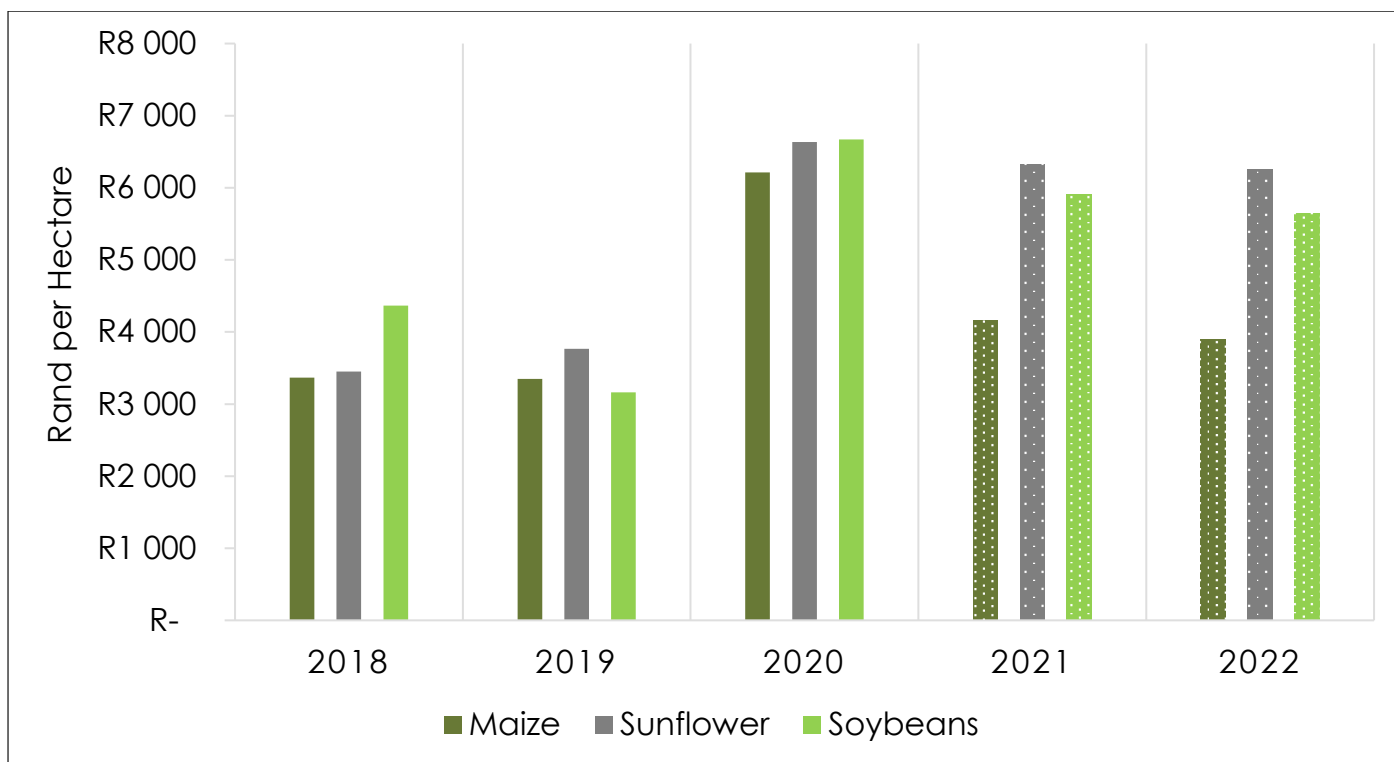


Figure 4.2: Dryland - **Deterministic** gross margin average by crop type: 2018-2022

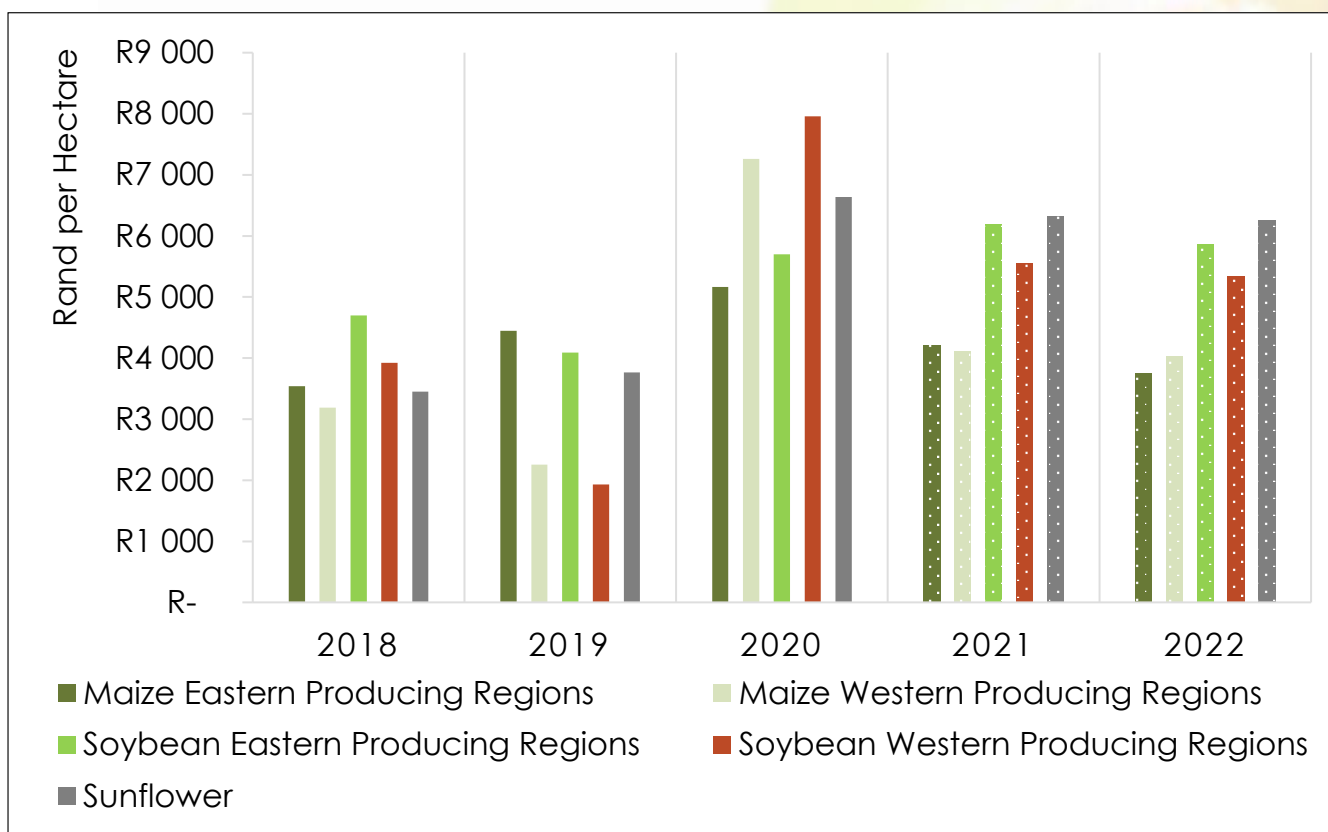


Figure 4.3: Dryland - **Deterministic** gross margin average by key producing region: 2018-2022

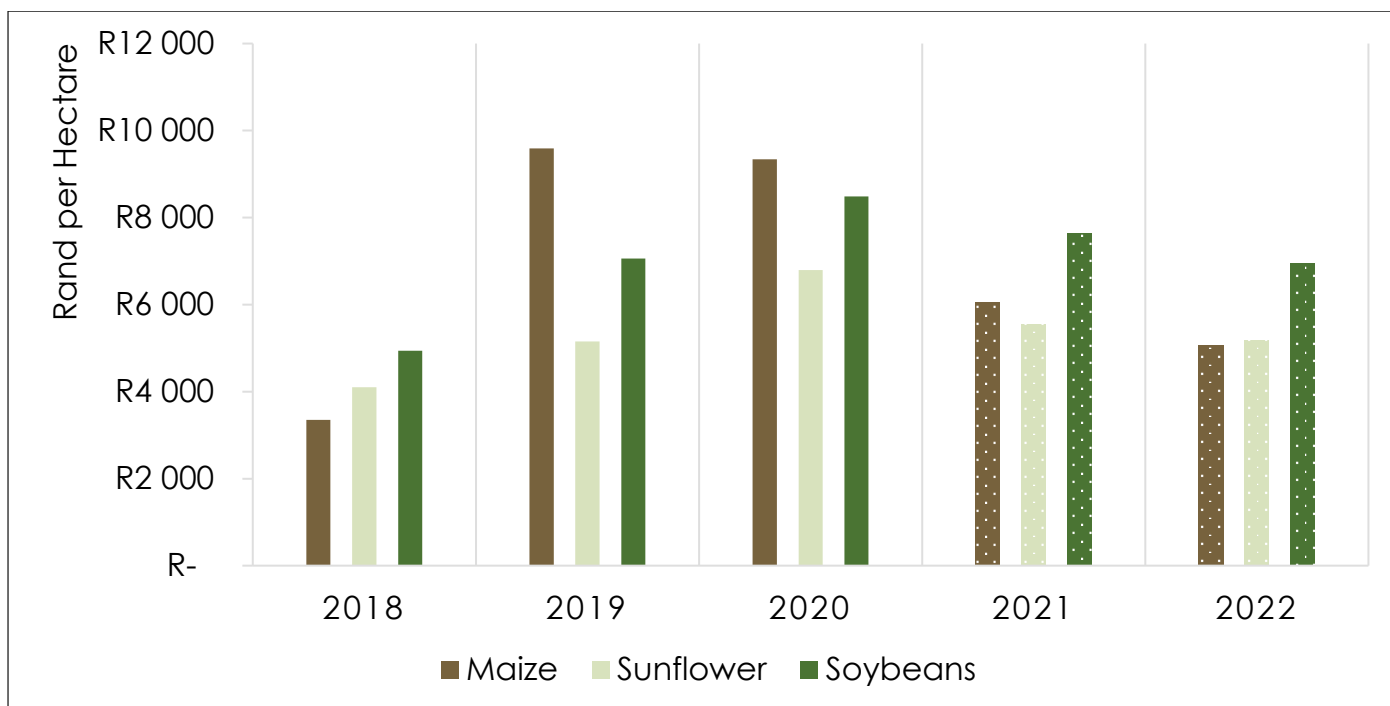


Figure 4.4: Irrigation - **Deterministic** gross margin average by crop type: 2018-2022