Income & Cost Budgets

Summer Crops – 2019/20



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

October 2019

INCOME & COST BUDGETS FOR SUMMER CROPS – 2019/20 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.

Historically, the Protein Research Foundation (PRF), Grain South Africa (GSA), the Bureau for Food and Agricultural Policy (BFAP) and agribusinesses have published their individual cost of production budgets which focusses on summer- and winter crops produced in South Africa's key agro-ecological zones, both under dryland- and irrigation cultivation. Given the existing activities associated within the organisations and the extent of the coverage of South African agricultural production, these initiatives are once again integrated to compile the 2019 summer crop budgets.

It is acknowledged that regional variation will occur and that estimates 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

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Area coverage

Table 1.1 and Table 1.2 indicates the area of coverage and include the dryland and irrigated crops. The source of data and collaborators are also included.

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

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Table 1.2: Area coverage: Irrigation

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

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Yield Assumptions

Figure 1.1 and Figure 1.2 present the yield assumptions for dryland and irrigated crops. The assumptions represent target yields where the respective crop input allocation is based on achieving the stipulated target yields. The target yields were determined in a round table discussion with industry experts.

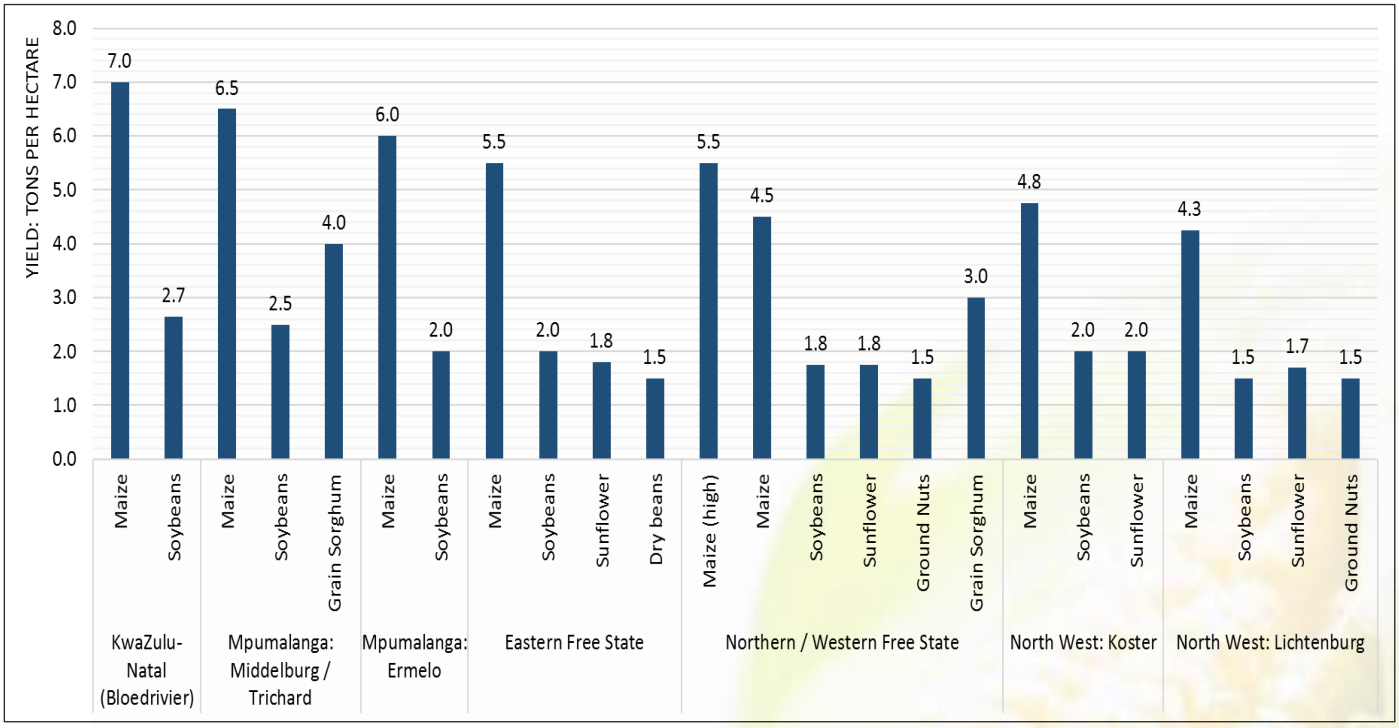


Figure 1.1: Dryland crops yield assumptions

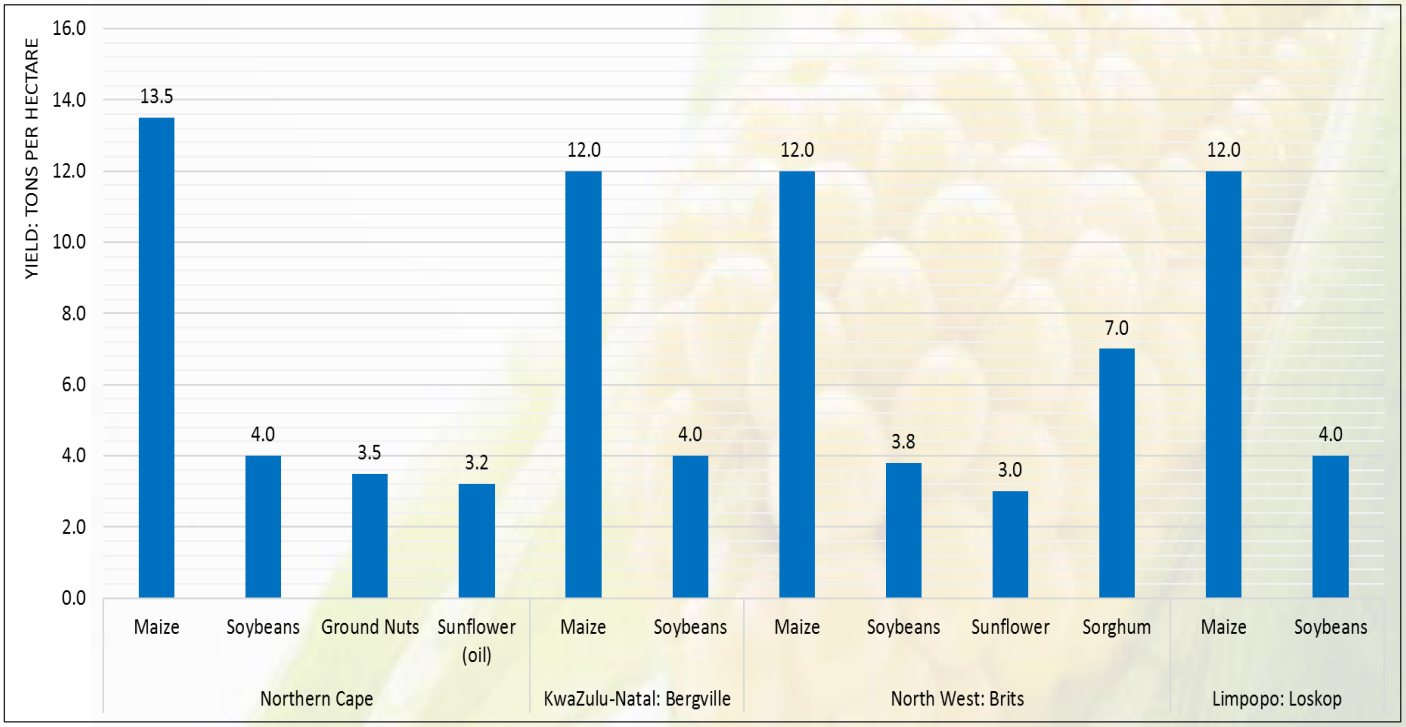


Figure 1.2: Irrigated crops yield assumptions

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Crop Price Assumptions

Annually, the Bureau for Food and Agricultural Policy (BFAP) generates an outlook for agricultural production, consumption, prices and trade in South Africa over a 10-year period. The information presented is based on assumptions about a range of economic, technological, environmental, political, institutional, and social factors. The outlook is generated by the BFAP system of linked models. One of the most important assumptions is that normal weather conditions will prevail in South Africa and around the world; therefore, yields grow constantly over the baseline as technology improves. Assumptions regarding the outlook of macroeconomic conditions 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. Once the critical assumptions are captured in the BFAP system of models, the Outlook for all commodities is simulated within a closed system of equations. This implies that, for example, any shocks in the grain sector are transmitted to the livestock sector and vice versa. Therefore, for each commodity, important components of supply and demand are identified, after which an equilibrium is established through balance sheet principles by equalling 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 2019/20 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.

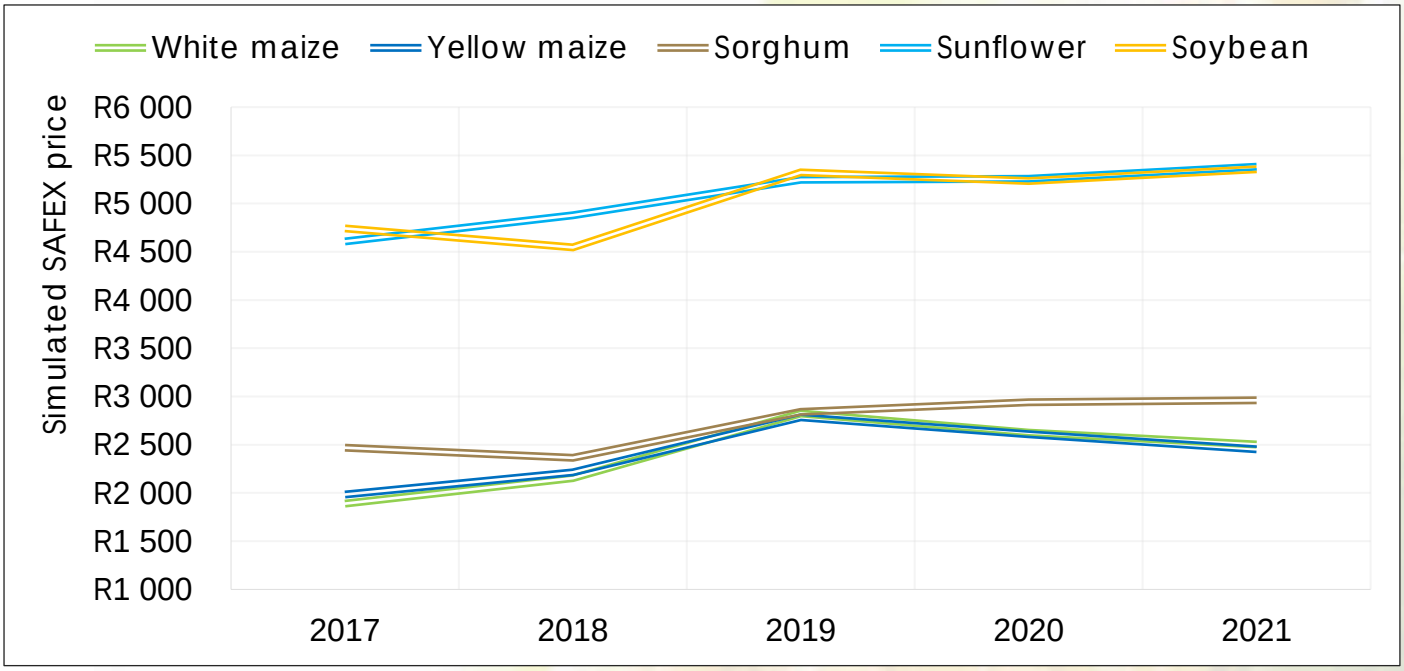


Figure 1.3: BFAP average annual commodity price projections: 2017-2021

Source: BFAP, October 2019

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Input Cost Trends & Assumptions

The cost of agricultural inputs in general, is expected to increase marginally over the period from 2018/19 to 2019/20 compared to the previous period. For this period, it is projected that the cost for herbicides will increase by more or less 8.0%, fertiliser by 2.1% and seed on average by 2.4%. This is seen as a relief for producers, followed by rapid increases in the cost of production over the period from 2017/18 to 2018/19 where double digits input cost inflation have been reported.

Figure 1.4 illustrates the cost trends for fuel and fertilisers over the period from January 2017 to September 2019. Figure 1.5 presents a cost index for seed, fertilisers, plant protection, fuel and maintenance. The base was set at 2008/09=100 which allows to compare cost trends among inputs. The graph suggests that the cost of pesticides and maintenance relative to other inputs has increased at a faster rate over the stipulated period.

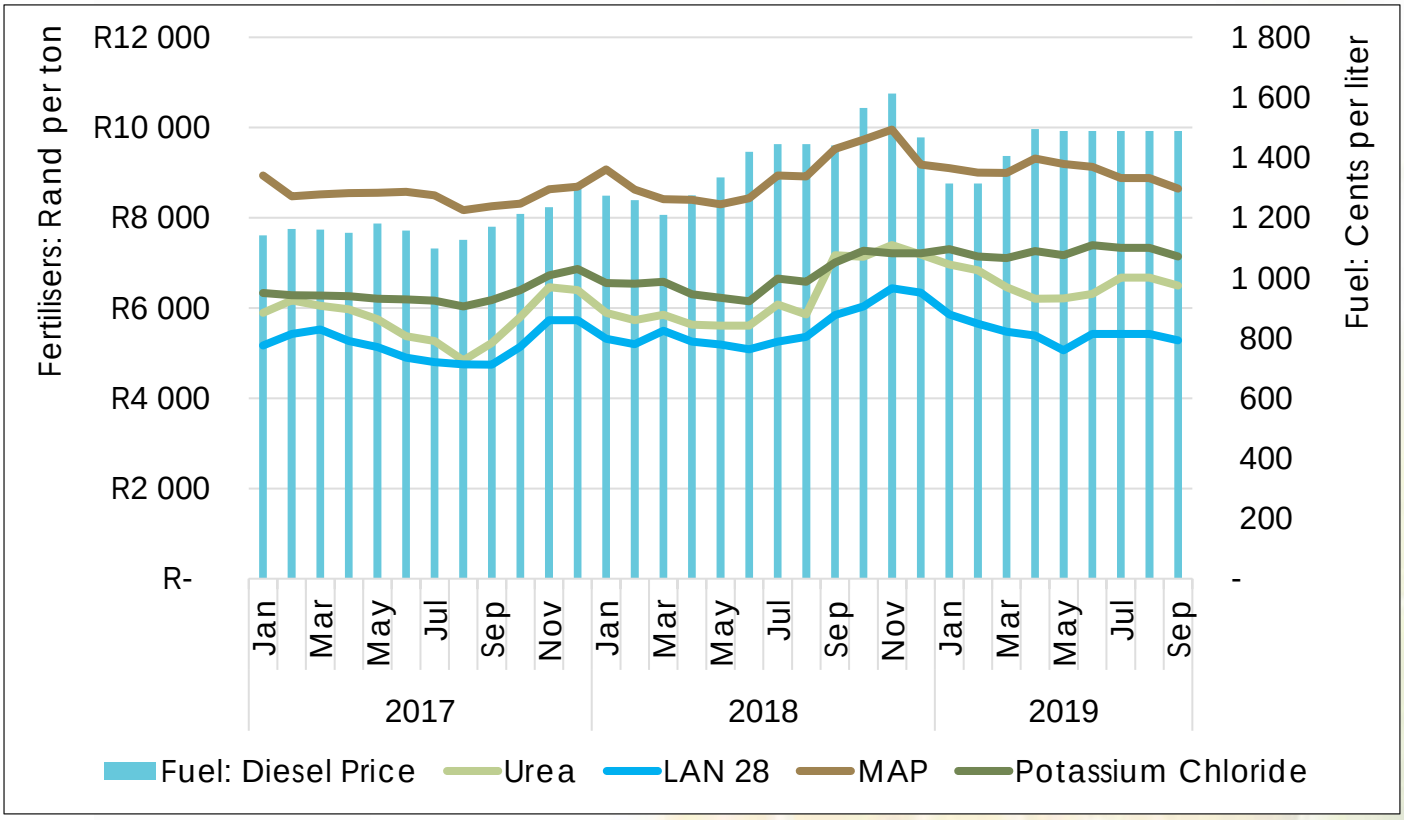


Figure 1.4: Fertiliser & fuel cost trends: January 2017 to September 2019

Source: Grain SA, October 2019

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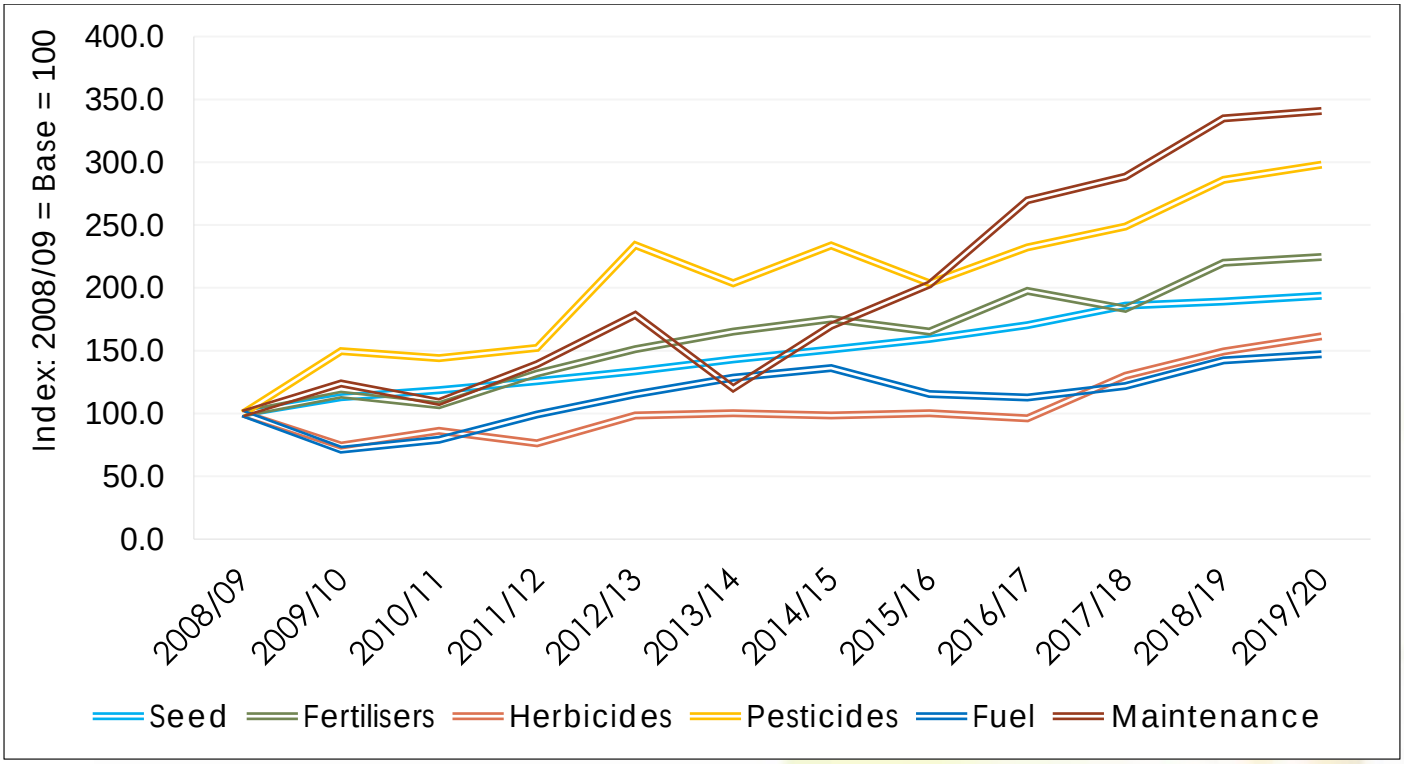


Figure 1.5: Input cost trend index: 2008/09 – 2019/20

Source: Grain SA, October 2019

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Methodology, Approach & Definitions

- A standard operating procedure was used across all crops and regions for generating the cost and income budgets for the 2019/20 production season.
- Deterministic or targeted 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.

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2019/20 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: 2020	R/TON	R2 610	R5 235
Total deductions	R/TON	R407	R141
- Transport differential	R/TON	R338	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R69	R141
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2 203	R5 094
GROSS INCOME	R/HA	R15 419	R13 498
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R-	R-
Crop insurance	R/HA	R586	R1 647
Fertilizer	R/HA	R3 585	R1 557
Lime	R/HA	R613	R-
Seed	R/HA	R2 561	R1 159
Fuel	R/HA	R1 102	R654
Herbicide	R/HA	R1 109	R900
Insecticide/Fungicide	R/HA	R679	R715
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R714	R447
Casual labour	R/HA	R171	R-
Aerial spray	R/HA	R-	R-
Other expenditure	R/HA	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R11 120	R7 079
TOTAL VARIABLE EXPENDITURE	R/TON	R1 589	R2 671
3.1) GROSS MARGIN:	R/HA	R4 300	R6 419
3.2) GROSS MARGIN:	R/TON	R614	R2 422
BREAK-EVEN YIELD	T/HA	5.05	1.39
BREAK-EVEN PRICE	R/TON	R1 589	R2 671

Source: BFAP, GSA & Individual Farmers, 2019

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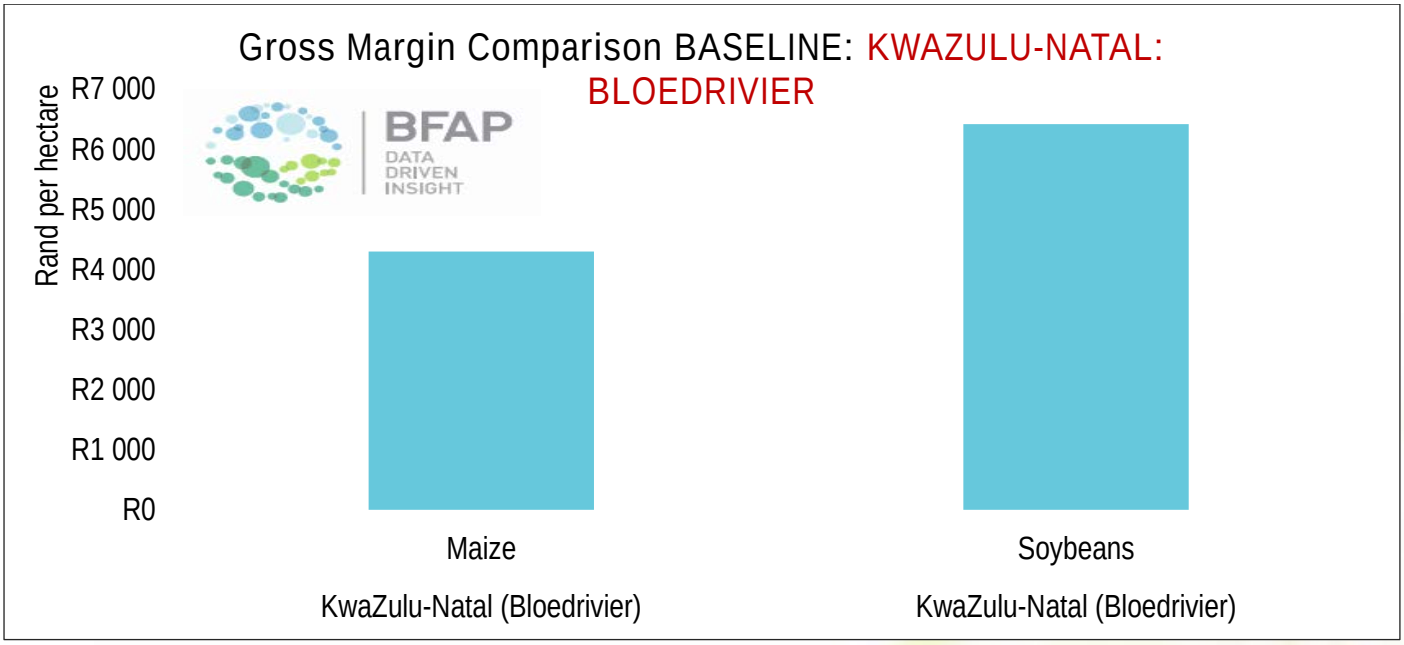


Figure 2.1: Gross margin comparison – Baseline: KwaZulu-Natal (Bloedrivier Region)

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

	YIELD (T/HA)						
PRODUCERS PRICE	5.50	6.00	6.50	7.00	7.50	8.00	8.50
R1 803	-R 1 204	-R 303	R 598	R 1 500	R 2 401	R 3 303	R 4 204
R1 903	-R 654	R 297	R 1 248	R 2 200	R 3 151	R 4 103	R 5 054
R2 003	-R 104	R 897	R 1 898	R 2 900	R 3 901	R 4 903	R 5 904
R2 103	R 446	R 1 497	R 2 548	R 3 600	R 4 651	R 5 703	R 6 754
R2 203	R 996	R 2 097	R 3 198	R 4 300	R 5 401	R 6 503	R 7 604
R2 303	R 1 546	R 2 697	R 3 848	R 5 000	R 6 151	R 7 303	R 8 454
R2 403	R 2 096	R 3 297	R 4 498	R 5 700	R 6 901	R 8 103	R 9 304
R2 503	R 2 646	R 3 897	R 5 148	R 6 400	R 7 651	R 8 903	R 10 154
R2 603	R 3 196	R 4 497	R 5 798	R 7 100	R 8 401	R 9 703	R 11 004

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

	YIELD (T/HA)						
PRODUCERS PRICE	2.00	2.25	2.50	2.65	3.00	3.25	3.50
R4 694	R 2 308	R 3 482	R 4 655	R 5 359	R 7 002	R 8 175	R 9 349
R4 794	R 2 508	R 3 707	R 4 905	R 5 624	R 7 302	R 8 500	R 9 699
R4 894	R 2 708	R 3 932	R 5 155	R 5 889	R 7 602	R 8 825	R 10 049
R4 994	R 2 908	R 4 157	R 5 405	R 6 154	R 7 902	R 9 150	R 10 399
R5 094	R 3 108	R 4 382	R 5 655	R 6 419	R 8 202	R 9 475	R 10 749
R5 194	R 3 308	R 4 607	R 5 905	R 6 684	R 8 502	R 9 800	R 11 099
R5 294	R 3 508	R 4 832	R 6 155	R 6 949	R 8 802	R 10 125	R 11 449
R5 394	R 3 708	R 5 057	R 6 405	R 7 214	R 9 102	R 10 450	R 11 799
R5 494	R 3 908	R 5 282	R 6 655	R 7 479	R 9 402	R 10 775	R 12 149

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SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): KWAZULU-NATAL: BLOEDRIVIER													
	PRICE (R/TON)												
YIELD	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
1.65	-R	3 469	-R	3 304	-R	3 139	-R	2 974	-R	2 809	-R	2 644	-R	2 479
1.90	-R	2 271	-R	2 081	-R	1 891	-R	1 701	-R	1 511	-R	1 321	-R	1 131
2.15	-R	1 072	-R	857	-R	642	-R	427	-R	212	R	3	R	218
2.40	R	126	R	366	R	606	R	846	R	1 086	R	1 326	R	1 566
2.65	R	1 324	R	1 589	R	1 854	R	2 119	R	2 384	R	2 649	R	2 914
2.90	R	2 523	R	2 813	R	3 103	R	3 393	R	3 683	R	3 973	R	4 263
3.15	R	3 721	R	4 036	R	4 351	R	4 666	R	4 981	R	5 296	R	5 611
3.40	R	4 919	R	5 259	R	5 599	R	5 939	R	6 279	R	6 619	R	6 959
3.65	R	6 118	R	6 483	R	6 848	R	7 213	R	7 578	R	7 943	R	8 308

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.
- 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.

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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: 2020	R/TON	R2 610	R5 235	R2 942	R2 610	R5 235
Total deductions	R/TON	R307	R141	R69	R356	R141
- Transport differential	R/TON	R238	R-	R-	R287	R-
- Grade differential	R/TON	R-	R-	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R69	R69	R141
Price premiums	R/TON	R-	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 303	R5 094	R2 873	R2 254	R5 094
GROSS INCOME	R/HA	R14 968	R12 734	R11 491	R13 523	R10 187
2) VARIABLE EXPENDITURES						
Contracting	R/HA	R-	R-	R-	R-	R-
Crop insurance	R/HA	R494	R1 044	R517	R446	R835
Fertilizer	R/HA	R3 479	R1 183	R1 830	R3 262	R1 070
Lime	R/HA	R600	R-	R600	R600	R-
Seed	R/HA	R2 305	R1 159	R528	R2 049	R1 063
Fuel	R/HA	R1 005	R637	R1 072	R1 166	R620
Herbicide	R/HA	R1 089	R900	R631	R1 089	R900
Insecticide/Fungicide	R/HA	R511	R715	R746	R511	R715
Marketing costs	R/HA	R-	R-	R-	R-	R-
Repairs and maintenance	R/HA	R879	R620	R799	R869	R532
Casual labour	R/HA	R171	R-	R171	R171	R-
Aerial spray	R/HA	R-	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R192	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R10 532	R6 258	R7 086	R10 161	R5 735
TOTAL VARIABLE EXPENDITURE	R/TON	R1 620	R2 503	R1 772	R1 694	R2 867
3.1) GROSS MARGIN:	R/HA	R4 436	R6 476	R4 405	R3 361	R4 452
3.2) GROSS MARGIN:	R/TON	R682	R2 590	R1 101	R560	R2 226
BREAK-EVEN YIELD	T/HA	4.57	1.23	2.47	4.51	1.13
BREAK-EVEN PRICE	R/TON	R1 620	R2 503	R1 772	R1 694	R2 867

Source: BFAP, GSA & Individual Farmers, 2019

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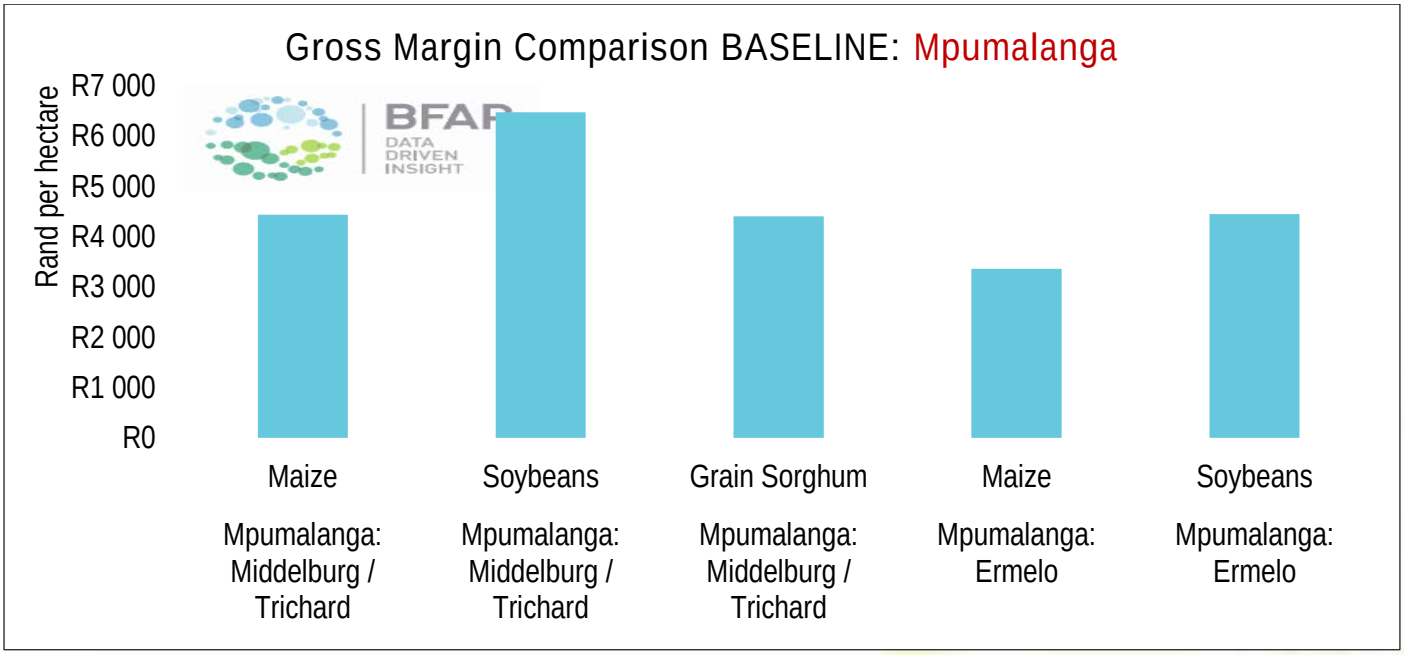


Figure 2.2: Gross margin comparison – Baseline: Mpumalanga

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 903	-R	1 018	-R	67	R	885	R	1 836	R	2 788	R	3 739	R	4 690		
R2 003	-R	518	R	483	R	1 485	R	2 486	R	3 488	R	4 489	R	5 490		
R2 103	-R	18	R	1 033	R	2 085	R	3 136	R	4 188	R	5 239	R	6 290		
R2 203	R	482	R	1 583	R	2 685	R	3 786	R	4 888	R	5 989	R	7 090		
R2 303	R	982	R	2 133	R	3 285	R	4 436	R	5 588	R	6 739	R	7 890		
R2 403	R	1 482	R	2 683	R	3 885	R	5 086	R	6 288	R	7 489	R	8 690		
R2 503	R	1 982	R	3 233	R	4 485	R	5 736	R	6 988	R	8 239	R	9 490		
R2 603	R	2 482	R	3 783	R	5 085	R	6 386	R	7 688	R	8 989	R	10 290		
R2 703	R	2 982	R	4 333	R	5 685	R	7 036	R	8 388	R	9 739	R	11 090		

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			
R4 694	R	1 956	R	3 129	R	4 302	R	5 476	R	6 649	R	7 822	R	8 996		
R4 794	R	2 131	R	3 329	R	4 527	R	5 726	R	6 924	R	8 122	R	9 321		
R4 894	R	2 306	R	3 529	R	4 752	R	5 976	R	7 199	R	8 422	R	9 646		
R4 994	R	2 481	R	3 729	R	4 977	R	6 226	R	7 474	R	8 722	R	9 971		
R5 094	R	2 656	R	3 929	R	5 202	R	6 476	R	7 749	R	9 022	R	10 296		
R5 194	R	2 831	R	4 129	R	5 427	R	6 726	R	8 024	R	9 322	R	10 621		
R5 294	R	3 006	R	4 329	R	5 652	R	6 976	R	8 299	R	9 622	R	10 946		
R5 394	R	3 181	R	4 529	R	5 877	R	7 226	R	8 574	R	9 922	R	11 271		
R5 494	R	3 356	R	4 729	R	6 102	R	7 476	R	8 849	R	10 222	R	11 596		

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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 854	-R	1 819	-R	893	R	34	R	961	R	1 888	R	2 815	R	3 742
R1 954	-R	1 369	-R	393	R	584	R	1 561	R	2 538	R	3 515	R	4 492
R2 054	-R	919	R	107	R	1 134	R	2 161	R	3 188	R	4 215	R	5 242
R2 154	-R	469	R	607	R	1 684	R	2 761	R	3 838	R	4 915	R	5 992
R2 254	-R	19	R	1 107	R	2 234	R	3 361	R	4 488	R	5 615	R	6 742
R2 354	R	431	R	1 607	R	2 784	R	3 961	R	5 138	R	6 315	R	7 492
R2 454	R	881	R	2 107	R	3 334	R	4 561	R	5 788	R	7 015	R	8 242
R2 554	R	1 331	R	2 607	R	3 884	R	5 161	R	6 438	R	7 715	R	8 992
R2 654	R	1 781	R	3 107	R	4 434	R	5 761	R	7 088	R	8 415	R	9 742

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	
R4 694	R	132	R	1 305	R	2 479	R	3 652	R	4 826	R	5 999	R	7 172
R4 794	R	257	R	1 455	R	2 654	R	3 852	R	5 051	R	6 249	R	7 447
R4 894	R	382	R	1 605	R	2 829	R	4 052	R	5 276	R	6 499	R	7 722
R4 994	R	507	R	1 755	R	3 004	R	4 252	R	5 501	R	6 749	R	7 997
R5 094	R	632	R	1 905	R	3 179	R	4 452	R	5 726	R	6 999	R	8 272
R5 194	R	757	R	2 055	R	3 354	R	4 652	R	5 951	R	7 249	R	8 547
R5 294	R	882	R	2 205	R	3 529	R	4 852	R	6 176	R	7 499	R	8 822
R5 394	R	1 007	R	2 355	R	3 704	R	5 052	R	6 401	R	7 749	R	9 097
R5 494	R	1 132	R	2 505	R	3 879	R	5 252	R	6 626	R	7 999	R	9 372

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): MPUMALANGA: MIDDELBURG / TRICHARD

YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
1.50	-R	3 504	-R	3 354	-R	3 204	-R	3 054	-R	2 904	-R	2 754	-R	2 604
1.75	-R	2 306	-R	2 131	-R	1 956	-R	1 781	-R	1 606	-R	1 431	-R	1 256
2.00	-R	1 107	-R	907	-R	707	-R	507	-R	307	-R	107	R	93
2.25	R	91	R	316	R	541	R	766	R	991	R	1 216	R	1 441
2.50	R	1 289	R	1 539	R	1 789	R	2 039	R	2 289	R	2 539	R	2 789
2.75	R	2 488	R	2 763	R	3 038	R	3 313	R	3 588	R	3 863	R	4 138
3.00	R	3 686	R	3 986	R	4 286	R	4 586	R	4 886	R	5 186	R	5 486
3.25	R	4 885	R	5 210	R	5 535	R	5 860	R	6 185	R	6 510	R	6 835
3.50	R	6 083	R	6 433	R	6 783	R	7 133	R	7 483	R	7 833	R	8 183

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): MPUMALANGA: ERMELO

YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
1.00	-R	4 303	-R	4 203	-R	4 103	-R	4 003	-R	3 903	-R	3 803	-R	3 703
1.25	-R	3 104	-R	2 979	-R	2 854	-R	2 729	-R	2 604	-R	2 479	-R	2 354
1.50	-R	1 906	-R	1 756	-R	1 606	-R	1 456	-R	1 306	-R	1 156	-R	1 006
1.75	-R	707	-R	532	-R	357	-R	182	-R	7	R	168	R	343
2.00	R	491	R	691	R	891	R	1 091	R	1 291	R	1 491	R	1 691
2.25	R	1 689	R	1 914	R	2 139	R	2 364	R	2 589	R	2 814	R	3 039
2.50	R	2 888	R	3 138	R	3 388	R	3 638	R	3 888	R	4 138	R	4 388
2.75	R	4 086	R	4 361	R	4 636	R	4 911	R	5 186	R	5 461	R	5 736
3.00	R	5 284	R	5 584	R	5 884	R	6 184	R	6 484	R	6 784	R	7 084

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.

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- 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.

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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: 2020	R/TON	R2 610	R5 235	R5 258	R12 000
Total deductions	R/TON	R373	R141	R382	R345
- Transport differential	R/TON	R304	R-	R258	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R124	R345
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 237	R5 094	R4 876	R11 655
GROSS INCOME	R/HA	R12 302	R10 187	R8 776	R17 483
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R-	R-	R-	R1 250
Crop insurance	R/HA	R369	R1 019	R439	R1 416
Fertilizer	R/HA	R3 157	R1 201	R933	R1 426
Lime	R/HA	R541	R-	R-	R460
Seed	R/HA	R1 434	R1 159	R671	R3 408
Fuel	R/HA	R1 179	R787	R840	R740
Herbicide	R/HA	R1 089	R900	R997	R1 240
Insecticide/Fungicide	R/HA	R511	R715	R141	R1 160
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R917	R650	R691	R581
Casual labour	R/HA	R171	R-	R-	R1 760
Aerial spray	R/HA	R-	R-	R-	R-
Other expenditure	R/HA	R-	R83	R-	R120
TOTAL VARIABLE EXPENDITURE	R/HA	R9 367	R6 514	R4 713	R13 561
TOTAL VARIABLE EXPENDITURE	R/TON	R1 703	R3 257	R2 618	R9 041
3.1) GROSS MARGIN:	R/HA	R2 935	R3 673	R4 063	R3 921
3.2) GROSS MARGIN:	R/TON	R534	R1 836	R2 257	R2 614
BREAK-EVEN YIELD	T/HA	4.19	1.28	0.97	1.16
BREAK-EVEN PRICE	R/TON	R1 703	R3 257	R2 618	R9 041

Source: BFAP, GSA, VKB & Individual Farmers, 2019

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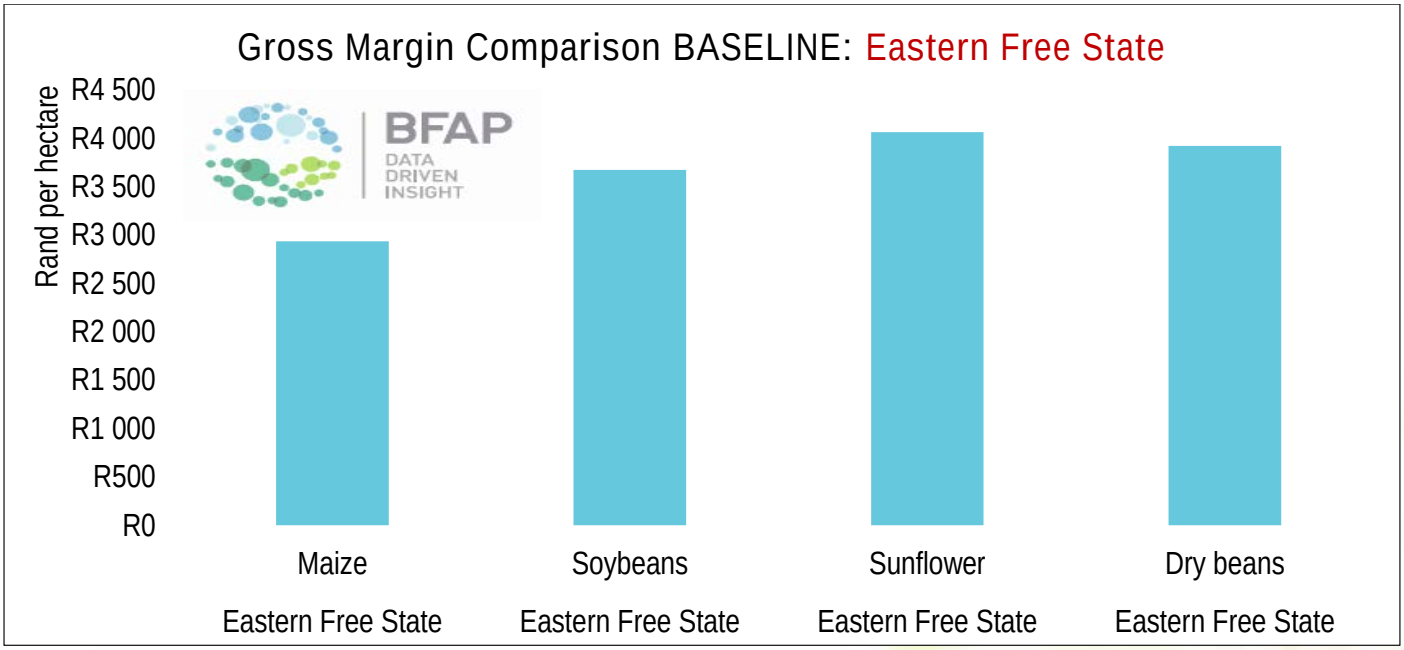


Figure 2.3: Gross margin comparison – Baseline: Eastern Free State

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		6.50		7.00	
R1 837	-R	2 020	-R	1 102	-R	184	R	735	R	1 653	R	2 572	R	3 490
R1 937	-R	1 620	-R	652	R	316	R	1 285	R	2 253	R	3 222	R	4 190
R2 037	-R	1 220	-R	202	R	816	R	1 835	R	2 853	R	3 872	R	4 890
R2 137	-R	820	R	248	R	1 316	R	2 385	R	3 453	R	4 522	R	5 590
R2 237	-R	420	R	698	R	1 816	R	2 935	R	4 053	R	5 172	R	6 290
R2 337	-R	20	R	1 148	R	2 316	R	3 485	R	4 653	R	5 822	R	6 990
R2 437	R	380	R	1 598	R	2 816	R	4 035	R	5 253	R	6 472	R	7 690
R2 537	R	780	R	2 048	R	3 316	R	4 585	R	5 853	R	7 122	R	8 390
R2 637	R	1 180	R	2 498	R	3 816	R	5 135	R	6 453	R	7 772	R	9 090

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		2.50		2.75	
R4 694	-R	647	R	526	R	1 700	R	2 873	R	4 046	R	5 220	R	6 393
R4 794	-R	522	R	676	R	1 875	R	3 073	R	4 271	R	5 470	R	6 668
R4 894	-R	397	R	826	R	2 050	R	3 273	R	4 496	R	5 720	R	6 943
R4 994	-R	272	R	976	R	2 225	R	3 473	R	4 721	R	5 970	R	7 218
R5 094	-R	147	R	1 126	R	2 400	R	3 673	R	4 946	R	6 220	R	7 493
R5 194	-R	22	R	1 276	R	2 575	R	3 873	R	5 171	R	6 470	R	7 768
R5 294	R	103	R	1 426	R	2 750	R	4 073	R	5 396	R	6 720	R	8 043
R5 394	R	228	R	1 576	R	2 925	R	4 273	R	5 621	R	6 970	R	8 318
R5 494	R	353	R	1 726	R	3 100	R	4 473	R	5 846	R	7 220	R	8 593

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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	
R4 476	-R	237	R	882	R	2 001	R	3 343	R	4 238	R	5 357	R	6 476
R4 576	-R	137	R	1 007	R	2 151	R	3 523	R	4 438	R	5 582	R	6 726
R4 676	-R	37	R	1 132	R	2 301	R	3 703	R	4 638	R	5 807	R	6 976
R4 776	R	63	R	1 257	R	2 451	R	3 883	R	4 838	R	6 032	R	7 226
R4 876	R	163	R	1 382	R	2 601	R	4 063	R	5 038	R	6 257	R	7 476
R4 976	R	263	R	1 507	R	2 751	R	4 243	R	5 238	R	6 482	R	7 726
R5 076	R	363	R	1 632	R	2 901	R	4 423	R	5 438	R	6 707	R	7 976
R5 176	R	463	R	1 757	R	3 051	R	4 603	R	5 638	R	6 932	R	8 226
R5 276	R	563	R	1 882	R	3 201	R	4 783	R	5 838	R	7 157	R	8 476

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): EASTERN FREE STATE														
YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
1.00	-R	4 655	-R	4 555	-R	4 455	-R	4 355	-R	4 255	-R	4 155	-R	4 055
1.25	-R	3 457	-R	3 332	-R	3 207	-R	3 082	-R	2 957	-R	2 832	-R	2 707
1.50	-R	2 259	-R	2 109	-R	1 959	-R	1 809	-R	1 659	-R	1 509	-R	1 359
1.75	-R	1 060	-R	885	-R	710	-R	535	-R	360	-R	185	-R	10
2.00	R	138	R	338	R	538	R	738	R	938	R	1 138	R	1 338
2.25	R	1 337	R	1 562	R	1 787	R	2 012	R	2 237	R	2 462	R	2 687
2.50	R	2 535	R	2 785	R	3 035	R	3 285	R	3 535	R	3 785	R	4 035
2.75	R	3 733	R	4 008	R	4 283	R	4 558	R	4 833	R	5 108	R	5 383
3.00	R	4 932	R	5 232	R	5 532	R	5 832	R	6 132	R	6 432	R	6 732

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 – 100:32:16. Soybeans N:P:K – 10:15:20. Sunflower N:P:K – 35:8:8. Dry beans N:P:K – 40:15:20.
- 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.

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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: 2020	R/TON	R2 624	R2 624	R5 235	R5 258	R8 875	R2 942
Total deductions	R/TON	R362	R305	R141	R377	R-	R80
- Transport differential	R/TON	R293	R236	R-	R253	R-	R-
- Grade differential	R/TON	R-	R-	R-	R-	R-	R17
- Marketing & Handling	R/TON	R69	R69	R141	R124	R-	R63
Price premiums	R/TON	R-	R-	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 262	R2 319	R5 094	R4 881	R8 875	R2 862
GROSS INCOME	R/HA	R12 440	R10 435	R8 914	R8 541	R13 313	R8 587
2) VARIABLE EXPENDITURES							
Contracting	R/HA	R-	R-	R-	R-	R-	R-
Crop insurance	R/HA	R348	R115	R820	R333	R160	R275
Fertilizer	R/HA	R2 571	R2 243	R854	R1 278	R1 204	R1 713
Lime	R/HA	R258	R258	R-	R-	R200	R150
Seed	R/HA	R1 287	R871	R889	R498	R1 522	R308
Fuel	R/HA	R1 121	R1 136	R649	R855	R1 100	R1 018
Herbicide	R/HA	R966	R966	R488	R159	R625	R631
Insecticide/Fungicide	R/HA	R409	R384	R66	R16	R665	R746
Marketing costs	R/HA	R-	R-	R-	R-	R-	R-
Repairs and maintenance	R/HA	R887	R818	R628	R572	R1 193	R751
Casual labour	R/HA	R171	R171	R-	R144	R-	R171
Aerial spray	R/HA	R-	R-	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-	R-	R173	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R8 018	R6 962	R4 394	R3 854	R6 842	R5 762
TOTAL VARIABLE EXPENDITURE	R/TON	R1 458	R1 547	R2 511	R2 202	R4 561	R1 921
3.1) GROSS MARGIN:	R/HA	R4 422	R3 473	R4 520	R4 687	R6 471	R2 824
3.2) GROSS MARGIN:	R/TON	R804	R772	R2 583	R2 678	R4 314	R941
BREAK-EVEN YIELD	T/HA	3.54	3.00	0.86	0.79	0.77	2.01
BREAK-EVEN PRICE	R/TON	R1 458	R1 547	R2 511	R2 202	R4 561	R1 921

Source: BFAP, GSA & Senwes, 2019

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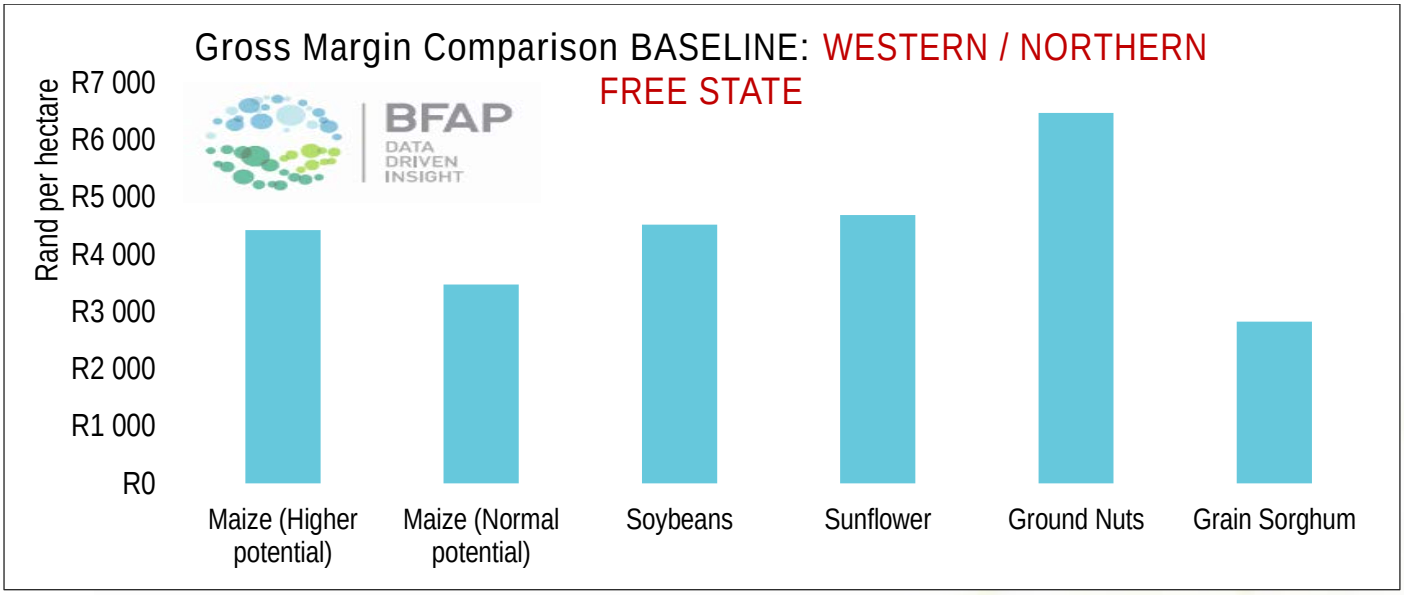


Figure 2.4: Gross margin comparison – Baseline: Western / Northern Free State

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 862	-R 571	R 360	R 1 291	R 2 222	R 3 153	R 4 084	R 5 015
R1 962	-R 171	R 810	R 1 791	R 2 772	R 3 753	R 4 734	R 5 715
R2 062	R 229	R 1 260	R 2 291	R 3 322	R 4 353	R 5 384	R 6 415
R2 162	R 629	R 1 710	R 2 791	R 3 872	R 4 953	R 6 034	R 7 115
R2 262	R 1 029	R 2 160	R 3 291	R 4 422	R 5 553	R 6 684	R 7 815
R2 362	R 1 429	R 2 610	R 3 791	R 4 972	R 6 153	R 7 334	R 8 515
R2 462	R 1 829	R 3 060	R 4 291	R 5 522	R 6 753	R 7 984	R 9 215
R2 562	R 2 229	R 3 510	R 4 791	R 6 072	R 7 353	R 8 634	R 9 915
R2 662	R 2 629	R 3 960	R 5 291	R 6 622	R 7 953	R 9 284	R 10 615

SOYBEANS 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
R4 694	R 300	R 1 473	R 2 646	R 3 820	R 4 993	R 6 166	R 7 340
R4 794	R 400	R 1 598	R 2 796	R 3 995	R 5 193	R 6 391	R 7 590
R4 894	R 500	R 1 723	R 2 946	R 4 170	R 5 393	R 6 616	R 7 840
R4 994	R 600	R 1 848	R 3 096	R 4 345	R 5 593	R 6 841	R 8 090
R5 094	R 700	R 1 973	R 3 246	R 4 520	R 5 793	R 7 066	R 8 340
R5 194	R 800	R 2 098	R 3 396	R 4 695	R 5 993	R 7 291	R 8 590
R5 294	R 900	R 2 223	R 3 546	R 4 870	R 6 193	R 7 516	R 8 840
R5 394	R 1 000	R 2 348	R 3 696	R 5 045	R 6 393	R 7 741	R 9 090
R5 494	R 1 100	R 2 473	R 3 846	R 5 220	R 6 593	R 7 966	R 9 340

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
R4 481	R 627	R 1 747	R 2 867	R 3 987	R 5 107	R 6 227	R 7 348
R4 581	R 727	R 1 872	R 3 017	R 4 162	R 5 307	R 6 452	R 7 598
R4 681	R 827	R 1 997	R 3 167	R 4 337	R 5 507	R 6 677	R 7 848
R4 781	R 927	R 2 122	R 3 317	R 4 512	R 5 707	R 6 902	R 8 098
R4 881	R 1 027	R 2 247	R 3 467	R 4 687	R 5 907	R 7 127	R 8 348
R4 981	R 1 127	R 2 372	R 3 617	R 4 862	R 6 107	R 7 352	R 8 598
R5 081	R 1 227	R 2 497	R 3 767	R 5 037	R 6 307	R 7 577	R 8 848
R5 181	R 1 327	R 2 622	R 3 917	R 5 212	R 6 507	R 7 802	R 9 098
R5 281	R 1 427	R 2 747	R 4 067	R 5 387	R 6 707	R 8 027	R 9 348

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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 475	R	190	R	2 533	R	4 877	R	7 221	R	9 565	R	11 908	R	14 252
R8 575	R	265	R	2 633	R	5 002	R	7 371	R	9 740	R	12 108	R	14 477
R8 675	R	340	R	2 733	R	5 127	R	7 521	R	9 915	R	12 308	R	14 702
R8 775	R	415	R	2 833	R	5 252	R	7 671	R	10 090	R	12 508	R	14 927
R8 875	R	490	R	2 933	R	5 377	R	7 821	R	10 265	R	12 708	R	15 152
R8 975	R	565	R	3 033	R	5 502	R	7 971	R	10 440	R	12 908	R	15 377
R9 075	R	640	R	3 133	R	5 627	R	8 121	R	10 615	R	13 108	R	15 602
R9 175	R	715	R	3 233	R	5 752	R	8 271	R	10 790	R	13 308	R	15 827
R9 275	R	790	R	3 333	R	5 877	R	8 421	R	10 965	R	13 508	R	16 052

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTHERN FREE STATE														
YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
0.75	-R	5 221	-R	5 146	-R	5 071	-R	4 996	-R	4 921	-R	4 846	-R	4 771
1.00	-R	4 023	-R	3 923	-R	3 823	-R	3 723	-R	3 623	-R	3 523	-R	3 423
1.25	-R	2 824	-R	2 699	-R	2 574	-R	2 449	-R	2 324	-R	2 199	-R	2 074
1.50	-R	1 626	-R	1 476	-R	1 326	-R	1 176	-R	1 026	-R	876	-R	726
1.75	-R	428	-R	253	-R	78	R	97	R	272	R	447	R	622
2.00	R	771	R	971	R	1 171	R	1 371	R	1 571	R	1 771	R	1 971
2.25	R	1 969	R	2 194	R	2 419	R	2 644	R	2 869	R	3 094	R	3 319
2.50	R	3 168	R	3 418	R	3 668	R	3 918	R	4 168	R	4 418	R	4 668
2.75	R	4 366	R	4 641	R	4 916	R	5 191	R	5 466	R	5 741	R	6 016

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 (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.
- 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.

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

Area		North West: Koster		
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: 2020	R/TON	R2 624	R5 235	R5 258
Total deductions	R/TON	R231	R141	R304
- Transport differential	R/TON	R162	R-	R180
- Grade differential	R/TON	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R124
Price premiums	R/TON	R-	R-	R-
Net Farm Gate Price	R/TON	R2 393	R5 094	R4 954
GROSS INCOME	R/HA	R11 366	R10 187	R9 907
2) VARIABLE EXPENDITURES				
Contracting	R/HA	R-	R-	R-
Crop insurance	R/HA	R239	R1 140	R288
Fertilizer	R/HA	R2 225	R1 022	R1 145
Lime	R/HA	R300	R-	R-
Seed	R/HA	R792	R696	R498
Fuel	R/HA	R993	R660	R832
Herbicide	R/HA	R848	R488	R159
Insecticide/Fungicide	R/HA	R409	R66	R16
Marketing costs	R/HA	R-	R-	R-
Repairs and maintenance	R/HA	R959	R545	R667
Casual labour	R/HA	R171	R-	R171
Aerial spray	R/HA	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-
TOTAL VARIABLE EXPENDITURE	R/HA	R6 936	R4 617	R3 775
TOTAL VARIABLE EXPENDITURE	R/TON	R1 460	R2 309	R1 888
3.1) GROSS MARGIN:	R/HA	R4 430	R5 570	R6 132
3.2) GROSS MARGIN:	R/TON	R933	R2 785	R3 066
BREAK-EVEN YIELD	T/HA	2.90	0.91	0.76
BREAK-EVEN PRICE	R/TON	R1 460	R2 309	R1 888

Source: BFAP, GSA, NWK & Individual Farmers, 2019

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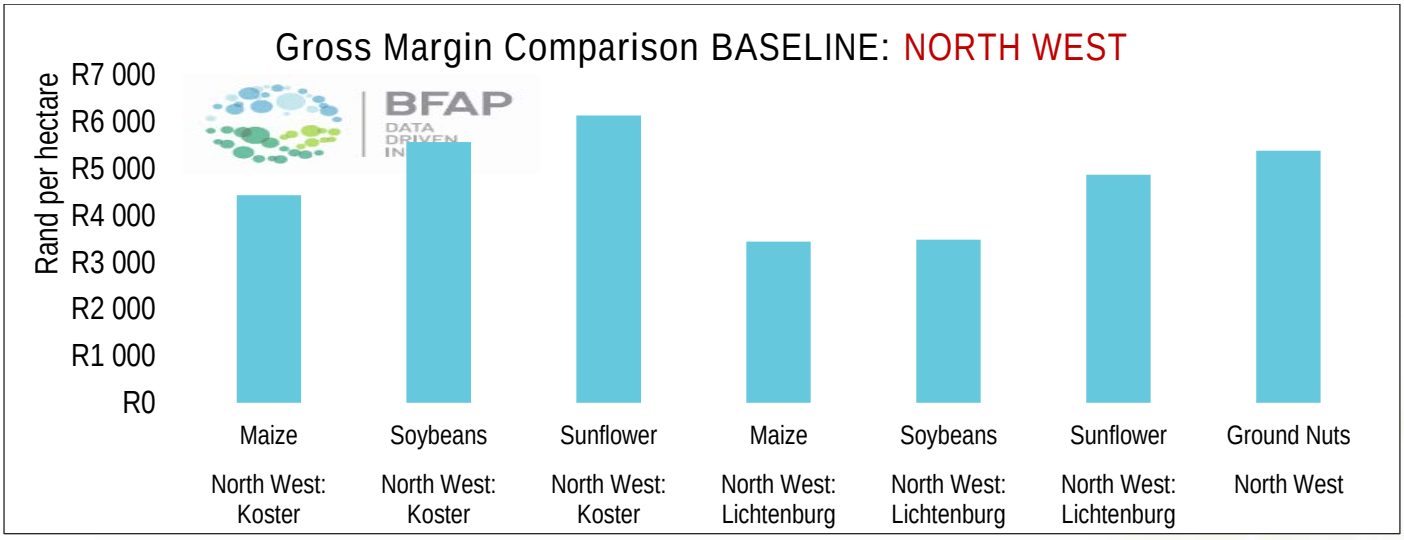


Figure 2.5: Gross margin comparison – Baseline: North West: Koster & Lichtenburg

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 993	-R 459	R 537	R 1 534	R 2 530	R 3 527	R 4 523	R 5 520
R2 093	-R 134	R 912	R 1 959	R 3 005	R 4 052	R 5 098	R 6 145
R2 193	R 191	R 1 287	R 2 384	R 3 480	R 4 577	R 5 673	R 6 770
R2 293	R 516	R 1 662	R 2 809	R 3 955	R 5 102	R 6 248	R 7 395
R2 393	R 841	R 2 037	R 3 234	R 4 430	R 5 627	R 6 823	R 8 020
R2 493	R 1 166	R 2 412	R 3 659	R 4 905	R 6 152	R 7 398	R 8 645
R2 593	R 1 491	R 2 787	R 4 084	R 5 380	R 6 677	R 7 973	R 9 270
R2 693	R 1 816	R 3 162	R 4 509	R 5 855	R 7 202	R 8 548	R 9 895
R2 793	R 2 141	R 3 537	R 4 934	R 6 330	R 7 727	R 9 123	R 10 520

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
R4 694	R 1 250	R 2 423	R 3 596	R 4 770	R 5 943	R 7 117	R 8 290
R4 794	R 1 375	R 2 573	R 3 771	R 4 970	R 6 168	R 7 367	R 8 565
R4 894	R 1 500	R 2 723	R 3 946	R 5 170	R 6 393	R 7 617	R 8 840
R4 994	R 1 625	R 2 873	R 4 121	R 5 370	R 6 618	R 7 867	R 9 115
R5 094	R 1 750	R 3 023	R 4 296	R 5 570	R 6 843	R 8 117	R 9 390
R5 500	R 2 258	R 3 633	R 5 008	R 6 383	R 7 758	R 9 133	R 10 508
R5 750	R 2 570	R 4 008	R 5 445	R 6 883	R 8 320	R 9 758	R 11 195
R6 000	R 2 883	R 4 383	R 5 883	R 7 383	R 8 883	R 10 383	R 11 883
R6 250	R 3 195	R 4 758	R 6 320	R 7 883	R 9 445	R 11 008	R 12 570

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
R4 554	R 1 917	R 3 055	R 4 193	R 5 332	R 6 470	R 7 609	R 8 747
R4 654	R 2 042	R 3 205	R 4 368	R 5 532	R 6 695	R 7 859	R 9 022
R4 754	R 2 167	R 3 355	R 4 543	R 5 732	R 6 920	R 8 109	R 9 297
R4 854	R 2 292	R 3 505	R 4 718	R 5 932	R 7 145	R 8 359	R 9 572
R4 954	R 2 417	R 3 655	R 4 893	R 6 132	R 7 370	R 8 609	R 9 847
R5 250	R 2 787	R 4 100	R 5 412	R 6 725	R 8 037	R 9 350	R 10 662
R5 500	R 3 100	R 4 475	R 5 850	R 7 225	R 8 600	R 9 975	R 11 350
R5 750	R 3 412	R 4 850	R 6 287	R 7 725	R 9 162	R 10 600	R 12 037
R6 000	R 3 725	R 5 225	R 6 725	R 8 225	R 9 725	R 11 225	R 12 725

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SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST KOSTER													
YIELD	PRICE (R/TON)												
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
0.50	-R	6 651	-R	6 601	-R	6 551	-R	6 501	-R	6 451	-R	6 401	-R	6 351
0.75	-R	5 452	-R	5 377	-R	5 302	-R	5 227	-R	5 152	-R	5 077	-R	5 002
1.00	-R	4 254	-R	4 154	-R	4 054	-R	3 954	-R	3 854	-R	3 754	-R	3 654
1.25	-R	3 056	-R	2 931	-R	2 806	-R	2 681	-R	2 556	-R	2 431	-R	2 306
2.00	R	540	R	740	R	940	R	1 140	R	1 340	R	1 540	R	1 740
1.75	-R	659	-R	484	-R	309	-R	134	R	41	R	216	R	391
2.00	R	540	R	740	R	940	R	1 140	R	1 340	R	1 540	R	1 740
2.25	R	1 738	R	1 963	R	2 188	R	2 413	R	2 638	R	2 863	R	3 088
2.50	R	2 936	R	3 186	R	3 436	R	3 686	R	3 936	R	4 186	R	4 436

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.
- 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.

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

Area		North West: Lichtenburg			
Crop		Maize	Soybeans	Sunflower	Ground Nuts
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: 2020	R/TON	R2 624	R5 235	R5 258	R8 875
Total deductions	R/TON	R281	R141	R347	R-
- Transport differential	R/TON	R212	R-	R223	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R124	R-
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 343	R5 094	R4 911	R8 875
GROSS INCOME	R/HA	R9 957	R7 640	R8 348	R13 313
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R-	R-	R-	R-
Crop insurance	R/HA	R150	R855	R234	R213
Fertilizer	R/HA	R1 992	R901	R930	R1 204
Lime	R/HA	R300	R-	R-	R216
Seed	R/HA	R633	R696	R498	R1 479
Fuel	R/HA	R1 136	R615	R811	R1 155
Herbicide	R/HA	R788	R488	R159	R625
Insecticide/Fungicide	R/HA	R384	R66	R16	R665
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R959	R538	R662	R1 273
Casual labour	R/HA	R171	R-	R171	R831
Aerial spray	R/HA	R-	R-	R-	R-
Other expenditure	R/HA	R-	R-	R-	R270
TOTAL VARIABLE EXPENDITURE	R/HA	R6 513	R4 159	R3 480	R7 932
TOTAL VARIABLE EXPENDITURE	R/TON	R1 533	R2 773	R2 047	R5 288
3.1) GROSS MARGIN:	R/HA	R3 444	R3 481	R4 868	R5 381
3.2) GROSS MARGIN:	R/TON	R810	R2 321	R2 863	R3 587
BREAK-EVEN YIELD	T/HA	2.78	0.82	0.71	0.89
BREAK-EVEN PRICE	R/TON	R1 533	R2 773	R2 047	R5 288

Source: BFAP, GSA, NWK & Individual Farmers, 2019

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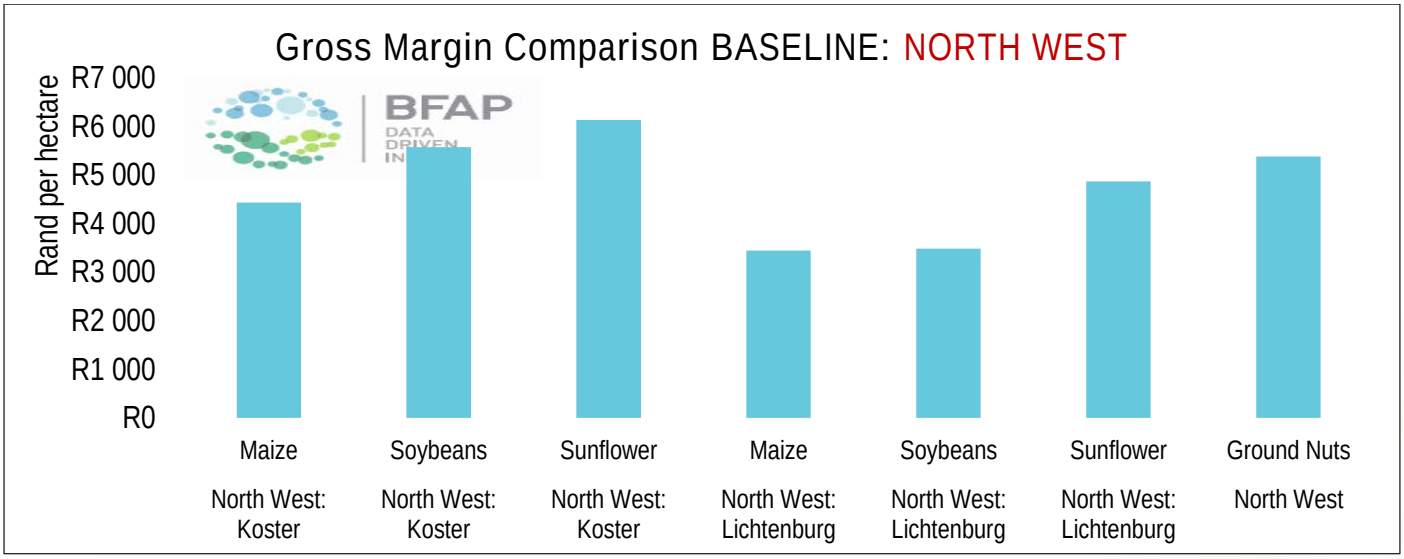


Figure 2.6: Gross margin comparison – Baseline: North West: Koster & Lichtenburg

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 943	-R	1 170	-R	199	R	772	R	1 744	R	2 715	R	3 687	R	4 658
R2 043	-R	895	R	126	R	1 147	R	2 169	R	3 190	R	4 212	R	5 233
R2 143	-R	620	R	451	R	1 522	R	2 594	R	3 665	R	4 737	R	5 808
R2 243	-R	345	R	776	R	1 897	R	3 019	R	4 140	R	5 262	R	6 383
R2 343	-R	70	R	1 101	R	2 272	R	3 444	R	4 615	R	5 787	R	6 958
R2 443	R	205	R	1 426	R	2 647	R	3 869	R	5 090	R	6 312	R	7 533
R2 543	R	480	R	1 751	R	3 022	R	4 294	R	5 565	R	6 837	R	8 108
R2 643	R	755	R	2 076	R	3 397	R	4 719	R	6 040	R	7 362	R	8 683
R2 743	R	1 030	R	2 401	R	3 772	R	5 144	R	6 515	R	7 887	R	9 258

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	
R4 694	-R	639	R	535	R	1 708	R	2 881	R	4 055	R	5 228	R	6 402
R4 794	-R	564	R	635	R	1 833	R	3 031	R	4 230	R	5 428	R	6 627
R4 894	-R	489	R	735	R	1 958	R	3 181	R	4 405	R	5 628	R	6 852
R4 994	-R	414	R	835	R	2 083	R	3 331	R	4 580	R	5 828	R	7 077
R5 094	-R	339	R	935	R	2 208	R	3 481	R	4 755	R	6 028	R	7 302
R5 194	-R	264	R	1 035	R	2 333	R	3 631	R	4 930	R	6 228	R	7 527
R5 294	-R	189	R	1 135	R	2 458	R	3 781	R	5 105	R	6 428	R	7 752
R5 394	-R	114	R	1 235	R	2 583	R	3 931	R	5 280	R	6 628	R	7 977
R5 494	-R	39	R	1 335	R	2 708	R	4 081	R	5 455	R	6 828	R	8 202

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	
R4 511	R	1 030	R	2 158	R	3 286	R	4 188	R	5 541	R	6 669	R	7 796
R4 611	R	1 130	R	2 283	R	3 436	R	4 358	R	5 741	R	6 894	R	8 046
R4 711	R	1 230	R	2 408	R	3 586	R	4 528	R	5 941	R	7 119	R	8 296
R4 811	R	1 330	R	2 533	R	3 736	R	4 698	R	6 141	R	7 344	R	8 546
R4 911	R	1 430	R	2 658	R	3 886	R	4 868	R	6 341	R	7 569	R	8 796
R5 011	R	1 530	R	2 783	R	4 036	R	5 038	R	6 541	R	7 794	R	9 046
R5 111	R	1 630	R	2 908	R	4 186	R	5 208	R	6 741	R	8 019	R	9 296
R5 211	R	1 730	R	3 033	R	4 336	R	5 378	R	6 941	R	8 244	R	9 546
R5 311	R	1 830	R	3 158	R	4 486	R	5 548	R	7 141	R	8 469	R	9 796

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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	900	R	1 443	R	3 787	R	6 131	R	8 475	R	10 818	R	13 162
R8 575	-R	825	R	1 543	R	3 912	R	6 281	R	8 650	R	11 018	R	13 387
R8 675	-R	750	R	1 643	R	4 037	R	6 431	R	8 825	R	11 218	R	13 612
R8 775	-R	675	R	1 743	R	4 162	R	6 581	R	9 000	R	11 418	R	13 837
R8 875	-R	600	R	1 843	R	4 287	R	6 731	R	9 175	R	11 618	R	14 062
R8 975	-R	525	R	1 943	R	4 412	R	6 881	R	9 350	R	11 818	R	14 287
R9 075	-R	450	R	2 043	R	4 537	R	7 031	R	9 525	R	12 018	R	14 512
R9 175	-R	375	R	2 143	R	4 662	R	7 181	R	9 700	R	12 218	R	14 737
R9 275	-R	300	R	2 243	R	4 787	R	7 331	R	9 875	R	12 418	R	14 962

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST LICHTENBURG														
YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
0.50	-R	5 206	-R	5 156	-R	5 106	-R	5 056	-R	5 006	-R	4 956	-R	4 906
0.75	-R	4 008	-R	3 933	-R	3 858	-R	3 783	-R	3 708	-R	3 633	-R	3 558
1.00	-R	2 809	-R	2 709	-R	2 609	-R	2 509	-R	2 409	-R	2 309	-R	2 209
1.25	-R	1 611	-R	1 486	-R	1 361	-R	1 236	-R	1 111	-R	986	-R	861
1.50	-R	412	-R	262	-R	112	R	38	R	188	R	338	R	488
1.75	R	786	R	961	R	1 136	R	1 311	R	1 486	R	1 661	R	1 836
2.00	R	1 984	R	2 184	R	2 384	R	2 584	R	2 784	R	2 984	R	3 184
2.25	R	3 183	R	3 408	R	3 633	R	3 858	R	4 083	R	4 308	R	4 533
2.50	R	4 381	R	4 631	R	4 881	R	5 131	R	5 381	R	5 631	R	5 881

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.
- 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.

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Northern Cape

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

Area		Northern Cape: Irrigation			
Crop		Maize	Soybeans	Ground Nuts	Sunflower
Production System		Irrigation	Irrigation	Irrigation	Irrigation
1) INCOME					
Yield: Deterministic	T/HA	13.50	4.00	3.50	3.20
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2020	R/TON	R2 610	R5 235	R9 930	R5 258
Total deductions	R/TON	R354	R141	R-	R-
- Transport differential	R/TON	R285	R-	R-	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R-	R-
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 256	R5 094	R9 930	R5 258
GROSS INCOME	R/HA	R30 453	R20 374	R36 555	R16 824
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R1 400	R1 400	R3 520	R1 400
Crop insurance	R/HA	R457	R1 080	R366	R421
Fertilizer	R/HA	R8 876	R5 367	R6 527	R4 727
Lime	R/HA	R640	R-	R700	R-
Seed	R/HA	R4 609	R2 015	R3 039	R990
Fuel	R/HA	R977	R441	R1 016	R844
Herbicide	R/HA	R255	R398	R296	R133
Insecticide/Fungicide	R/HA	R2 737	R1 284	R3 797	R239
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R586	R228	R668	R634
Casual labour	R/HA	R197	R-	R162	R-
Aerial spray	R/HA	R400	R-	R-	R-
Irrigation Electricity	R/HA	R3 152	R3 152	R3 244	R2 239
Water	R/HA	R1 097	R1 097	R1 129	R779
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R532	R532	R2 632	R532
TOTAL VARIABLE EXPENDITURE	R/HA	R25 914	R16 994	R27 095	R12 938
TOTAL VARIABLE EXPENDITURE	R/TON	R1 920	R4 248	R7 741	R4 043
3.1) GROSS MARGIN:	R/HA	R4 538	R3 380	R9 460	R3 886
3.2) GROSS MARGIN:	R/TON	R336	R845	R2 703	R1 214
BREAK-EVEN YIELD	T/HA	11.49	3.34	2.73	2.46
BREAK-EVEN PRICE	R/TON	R1 920	R4 248	R7 741	R4 043

Source: BFAP, GSA & GWK, 2019

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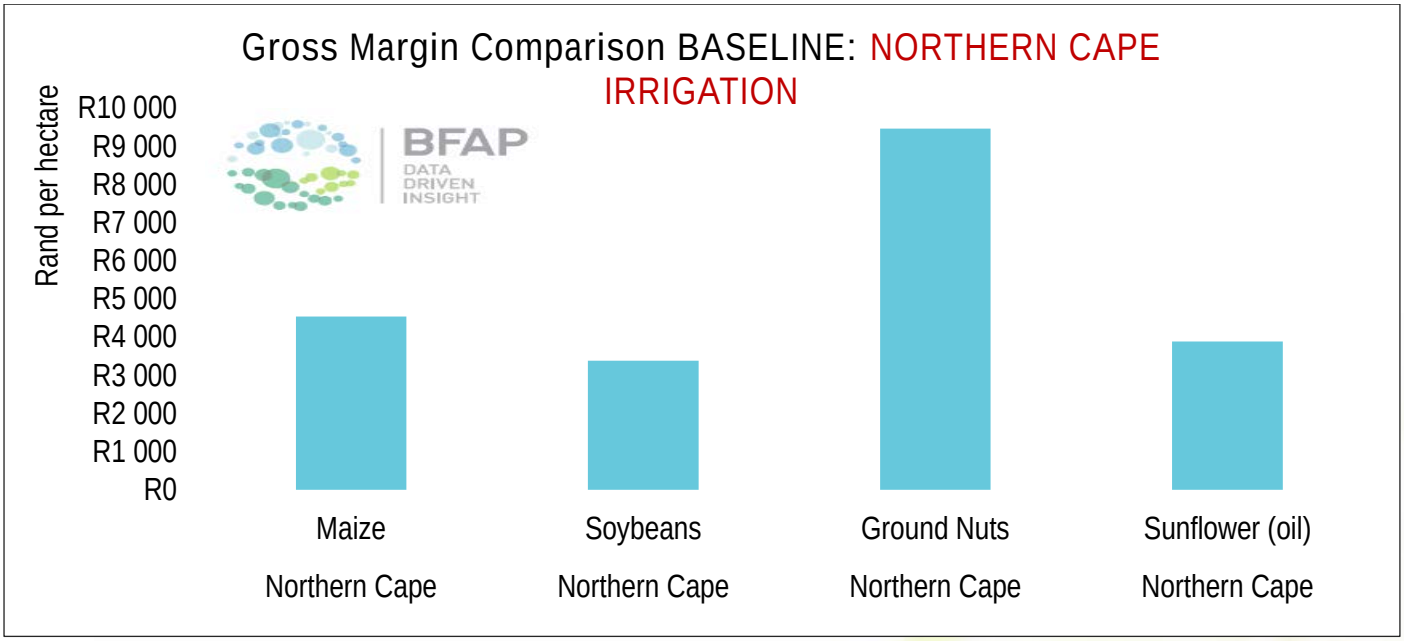


Figure 3.1: Gross margin comparison – Baseline: Northern Cape Irrigation

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

| | YIELD (T/HA) | | |

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		5.00	
R9 530	R	1 587.70	R	4 195	R	6 803	R	9 410	R	14 625	R	19 840	R	25 055
R9 630	R	1 863	R	4 495	R	7 128	R	9 760	R	15 025	R	20 290	R	25 555
R9 730	R	2 138	R	4 795	R	7 453	R	10 110	R	15 425	R	20 740	R	26 055
R9 830	R	2 413	R	5 095	R	7 778	R	10 460	R	15 825	R	21 190	R	26 555
R9 930	R	2 688	R	5 395	R	8 103	R	10 810	R	16 225	R	21 640	R	27 055
R10 030	R	2 963	R	5 695	R	8 428	R	11 160	R	16 625	R	22 090	R	27 555
R10 130	R	3 238	R	5 995	R	8 753	R	11 510	R	17 025	R	22 540	R	28 055
R10 230	R	3 513	R	6 295	R	9 078	R	11 860	R	17 425	R	22 990	R	28 555
R10 330	R	3 788	R	6 595	R	9 403	R	12 210	R	17 825	R	23 440	R	29 055

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		4.70	
R4 858	-R	1 037	R	178	R	1 392	R	2 606	R	5 035	R	7 464	R	9 893
R4 958	-R	792	R	448	R	1 687	R	2 926	R	5 405	R	7 884	R	10 363
R5 058	-R	547	R	718	R	1 982	R	3 246	R	5 775	R	8 304	R	10 833
R5 158	-R	302	R	988	R	2 277	R	3 566	R	6 145	R	8 724	R	11 303
R5 258	-R	57	R	1 258	R	2 572	R	3 886	R	6 515	R	9 144	R	11 773
R5 358	R	188	R	1 528	R	2 867	R	4 206	R	6 885	R	9 564	R	12 243
R5 458	R	433	R	1 798	R	3 162	R	4 526	R	7 255	R	9 984	R	12 713
R5 558	R	678	R	2 068	R	3 457	R	4 846	R	7 625	R	10 404	R	13 183
R5 658	R	923	R	2 338	R	3 752	R	5 166	R	7 995	R	10 824	R	13 653

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTHERN CAPE IRRIGATION														
YIELD	PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
3.00	-R	7 152	-R	6 852	-R	6 552	-R	6 252	-R	5 952	-R	5 652	-R	5 352
3.25	-R	5 953	-R	5 628	-R	5 303	-R	4 978	-R	4 653	-R	4 328	-R	4 003
3.50	-R	4 755	-R	4 405	-R	4 055	-R	3 705	-R	3 355	-R	3 005	-R	2 655
3.75	-R	3 557	-R	3 182	-R	2 807	-R	2 432	-R	2 057	-R	1 682	-R	1 307
4.00	-R	2 358	-R	1 958	-R	1 558	-R	1 158	-R	758	-R	358	R	42
4.25	-R	1 160	-R	735	-R	310	R	115	R	540	R	965	R	1 390
4.50	R	38	R	488	R	938	R	1 388	R	1 838	R	2 288	R	2 738
4.75	R	1 237	R	1 712	R	2 187	R	2 662	R	3 137	R	3 612	R	4 087
5.00	R	2 435	R	2 935	R	3 435	R	3 935	R	4 435	R	4 935	R	5 435

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.
- 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.

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

Area		KwaZulu-Natal: Bergrivier	
Crop		Maize	Soybeans
Production System		Irrigation	Irrigation
1) INCOME			
Yield: Deterministic	T/HA	12.00	4.00
SAFEX SIMULATED PRICE / PRODUCER PRICE: 2020	R/TON	R2 610	R5 235
Total deductions	R/TON	R389	R141
- Transport differential	R/TON	R320	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R69	R141
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2 221	R5 094
GROSS INCOME	R/HA	R26 649	R20 374
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R-	R-
Crop insurance	R/HA	R1 013	R2 852
Fertilizer	R/HA	R6 443	R2 441
Lime	R/HA	R600	R-
Seed	R/HA	R3 688	R2 015
Fuel	R/HA	R1 079	R820
Herbicide	R/HA	R1 109	R900
Insecticide/Fungicide	R/HA	R679	R715
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R714	R624
Casual labour	R/HA	R197	R-
Aerial spray	R/HA	R-	R-
Irrigation Electricity	R/HA	R2 049	R1 744
Water	R/HA	R1 936	R1 648
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R532	R532
TOTAL VARIABLE EXPENDITURE	R/HA	R20 038	R14 291
TOTAL VARIABLE EXPENDITURE	R/TON	R1 670	R3 573
3.1) GROSS MARGIN:	R/HA	R6 611	R6 083
3.2) GROSS MARGIN:	R/TON	R551	R1 521
BREAK-EVEN YIELD	T/HA	9.02	2.81
BREAK-EVEN PRICE	R/TON	R1 670	R3 573

Source: BFAP, GSA & Individual Farmers, 2019

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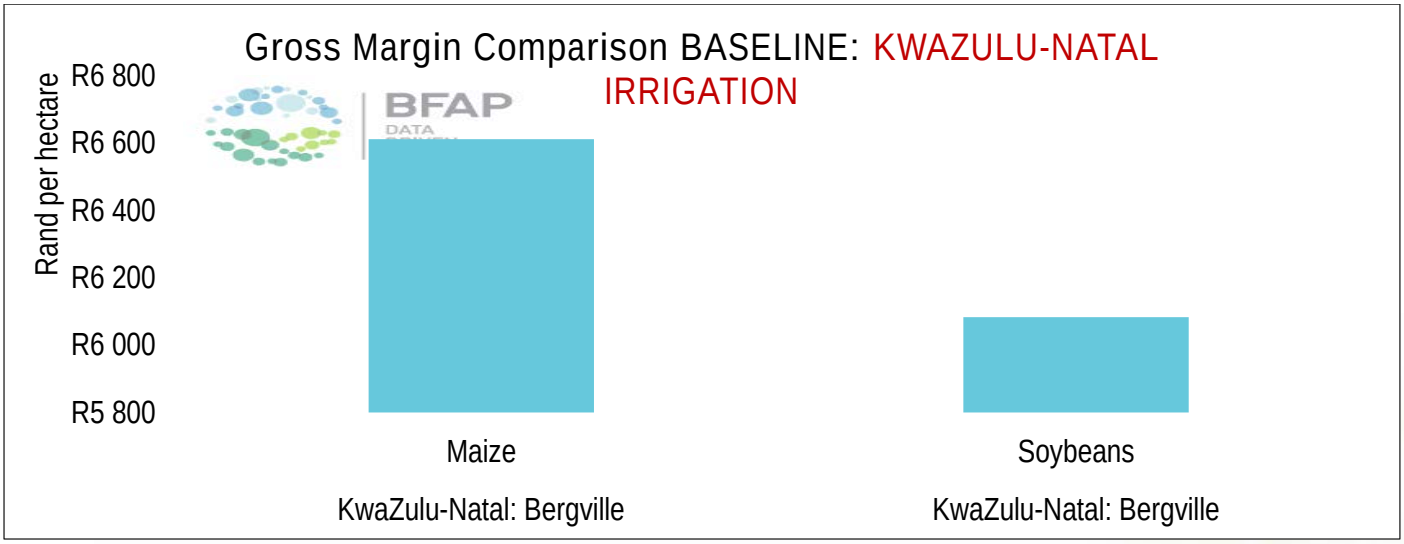


Figure 3.2: Gross margin comparison – Baseline: KwaZulu-Natal: Bergrivier

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 821	-R 920	-R 10	R 901	R 1 811	R 2 722	R 3 632	R 4 542
R1 921	R 130	R 1 090	R 2 051	R 3 011	R 3 972	R 4 932	R 5 892
R2 021	R 1 180	R 2 190	R 3 201	R 4 211	R 5 222	R 6 232	R 7 242
R2 121	R 2 230	R 3 290	R 4 351	R 5 411	R 6 472	R 7 532	R 8 592
R2 221	R 3 280	R 4 390	R 5 501	R 6 611	R 7 722	R 8 832	R 9 942
R2 321	R 4 330	R 5 490	R 6 651	R 7 811	R 8 971.55	R 10 132	R 11 292
R2 421	R 5 380	R 6 590	R 7 801	R 9 011	R 10 222	R 11 432	R 12 642
R2 521	R 6 430	R 7 690	R 8 951	R 10 211	R 11 472	R 12 732	R 13 992
R2 621	R 7 480	R 8 790	R 10 101	R 11 411	R 12 722	R 14 032	R 15 342

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
R4 694	R 963	R 2 136	R 3 310	R 4 483	R 5 656	R 6 830	R 8 003
R4 794	R 1 288	R 2 486	R 3 685	R 4 883	R 6 081	R 7 280	R 8 478
R4 894	R 1 613	R 2 836	R 4 060	R 5 283	R 6 506	R 7 730	R 8 953
R4 994	R 1 938	R 3 186	R 4 435	R 5 683	R 6 931	R 8 180	R 9 428
R5 094	R 2 263	R 3 536	R 4 810	R 6 083	R 7 356	R 8 630	R 9 903
R5 194	R 2 588	R 3 886	R 5 185	R 6 483	R 7 781	R 9 080	R 10 378
R5 294	R 2 913	R 4 236	R 5 560	R 6 883	R 8 206	R 9 530	R 10 853
R5 394	R 3 238	R 4 586	R 5 935	R 7 283	R 8 631	R 9 980	R 11 328
R5 494	R 3 563	R 4 936	R 6 310	R 7 683	R 9 056	R 10 430	R 11 803

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

YIELD	PRICE (R/TON)						
	R 4 794	R 4 894	R 4 994	R 5 094	R 5 194	R 5 294	R 5 394
3.00	-R 6 522	-R 6 222	-R 5 922	-R 5 622	-R 5 322	-R 5 022	-R 4 722
3.25	-R 5 323	-R 4 998	-R 4 673	-R 4 348	-R 4 023	-R 3 698	-R 3 373
3.50	-R 4 125	-R 3 775	-R 3 425	-R 3 075	-R 2 725	-R 2 375	-R 2 025
3.75	-R 2 927	-R 2 552	-R 2 177	-R 1 802	-R 1 427	-R 1 052	-R 677
4.00	-R 1 728	-R 1 328	-R 928	-R 528	-R 128	R 272	R 672
4.25	-R 530	-R 105	R 320	R 745	R 1 170	R 1 595	R 2 020
4.50	R 669	R 1 119	R 1 569	R 2 019	R 2 469	R 2 919	R 3 369
4.75	R 1 867	R 2 342	R 2 817	R 3 292	R 3 767	R 4 242	R 4 717
5.00	R 3 065	R 3 565	R 4 065	R 4 565	R 5 065	R 5 565	R 6 065

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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 – 20:36:40.
- 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.

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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: 2020	R/TON	R2 610	R5 235	R5 258	R2 942
Total deductions	R/TON	R229	R141	R303	R63
- Transport differential	R/TON	R160	R-	R179	R-
- Grade differential	R/TON	R-	R-	R-	R-
- Marketing & Handling	R/TON	R69	R141	R124	R63
Price premiums	R/TON	R-	R-	R-	R-
Net Farm Gate Price	R/TON	R2 381	R5 094	R4 955	R2 879
GROSS INCOME	R/HA	R28 569	R19 355	R14 864	R20 151
2) VARIABLE EXPENDITURES					
Contracting	R/HA	R-	R-	R-	R-
Crop insurance	R/HA	R1 171	R890	R306	R513
Fertilizer	R/HA	R6 443	R2 370	R1 918	R3 505
Lime	R/HA	R640	R-	R-	R416
Seed	R/HA	R3 585	R2 015	R782	R704
Fuel	R/HA	R1 403	R829	R1 070	R1 117
Herbicide	R/HA	R842	R780	R231	R631
Insecticide/Fungicide	R/HA	R403	R180	R572	R353
Marketing costs	R/HA	R-	R-	R-	R-
Repairs and maintenance	R/HA	R897	R378	R696	R649
Casual labour	R/HA	R197	R-	R105	R133
Aerial spray	R/HA	R-	R-	R-	R213
Irrigation Electricity	R/HA	R3 101	R2 425	R1 692	R2 537
Water	R/HA	R2 140	R1 673	R1 167	R1 751
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R372	R394	R372	R394
TOTAL VARIABLE EXPENDITURE	R/HA	R21 194	R11 934	R8 910	R12 915
TOTAL VARIABLE EXPENDITURE	R/TON	R1 766	R3 141	R2 970	R1 845
3.1) GROSS MARGIN:	R/HA	R7 375	R7 421	R5 954	R7 236
3.2) GROSS MARGIN:	R/TON	R615	R1 953	R1 985	R1 034
BREAK-EVEN YIELD	T/HA	8.90	2.34	1.80	4.49
BREAK-EVEN PRICE	R/TON	R1 766	R3 141	R2 970	R1 845

Source: BFAP, GSA, NWK & Individual Farmers, 2019

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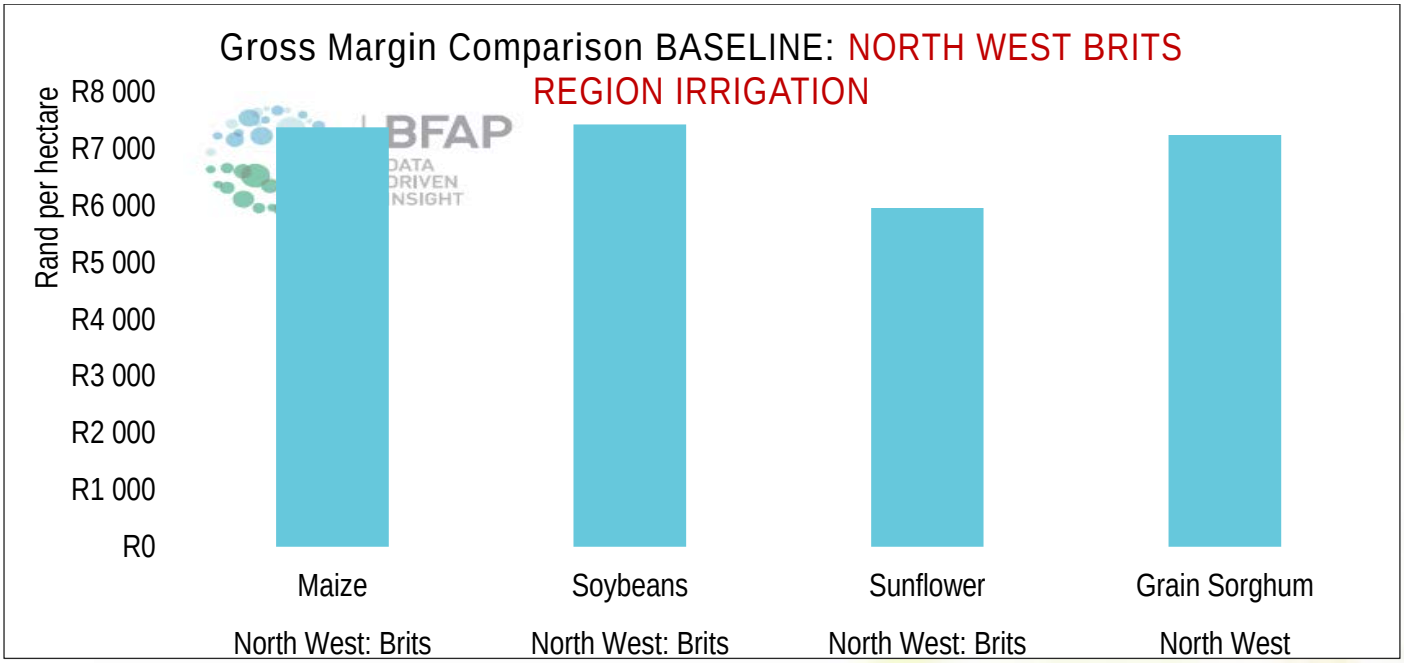


Figure 3.3: Gross margin comparison – Baseline: North West: Brits Region

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
R1 981	-R 396	R	594	R	1 585	R	2 575	R	3 566	R	4 556	R	5 546
R2 081	R 654	R	1 694	R	2 735	R	3 775	R	4 816	R	5 856	R	6 896
R2 181	R 1 704	R	2 794	R	3 885	R	4 975	R	6 066	R	7 156	R	8 246
R2 281	R 2 754	R	3 894	R	5 035	R	6 175	R	7 316	R	8 456	R	9 596
R2 381	R 3 804	R	4 994	R	6 185	R	7 375	R	8 566	R	9 756	R	10 946
R2 481	R 4 854	R	6 094	R	7 335	R	8 575	R	9 815.60	R	11 056	R	12 296
R2 581	R 5 904	R	7 194	R	8 485	R	9 775	R	11 066	R	12 356	R	13 646
R2 681	R 6 954	R	8 294	R	9 635	R	10 975	R	12 316	R	13 656	R	14 996
R2 781	R 8 004	R	9 394	R	10 785	R	12 175	R	13 566	R	14 956	R	16 346

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
R4 694	R 2 146	R	3 320	R	4 493	R	5 901	R	6 840	R	8 013	R	9 187
R4 794	R 2 446	R	3 645	R	4 843	R	6 281	R	7 240	R	8 438	R	9 637
R4 894	R 2 746	R	3 970	R	5 193	R	6 661	R	7 640	R	8 863	R	10 087
R4 994	R 3 046	R	4 295	R	5 543	R	7 041	R	8 040	R	9 288	R	10 537
R5 094	R 3 346	R	4 620	R	5 893	R	7 421	R	8 440	R	9 713	R	10 987
R5 194	R 3 646	R	4 945	R	6 243	R	7 801	R	8 840	R	10 138	R	11 437
R5 294	R 3 946	R	5 270	R	6 593	R	8 181	R	9 240	R	10 563	R	11 887
R5 394	R 4 246	R	5 595	R	6 943	R	8 561	R	9 640	R	10 988	R	12 337
R5 494	R 4 546	R	5 920	R	7 293	R	8 941	R	10 040	R	11 413	R	12 787

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SUNFLOWER SENSITIVITY ANALYSIS (GROSS MARGIN PER HECTARE): NORTH WEST BRITS														
	YIELD (T/HA)													
PRODUCERS PRICE	2.25		2.50		2.75		3.00		3.25		3.50		3.75	
R4 555	R	1 338	R	2 476	R	3 615	R	4 754	R	5 892	R	7 031	R	8 170
R4 655	R	1 563	R	2 726	R	3 890	R	5 054	R	6 217	R	7 381	R	8 545
R4 755	R	1 788	R	2 976	R	4 165	R	5 354	R	6 542	R	7 731	R	8 920
R4 855	R	2 013	R	3 226	R	4 440	R	5 654	R	6 867	R	8 081	R	9 295
R4 955	R	2 238	R	3 476	R	4 715	R	5 954	R	7 192	R	8 431	R	9 670
R5 055	R	2 463	R	3 726	R	4 990	R	6 254	R	7 517	R	8 781	R	10 045
R5 155	R	2 688	R	3 976	R	5 265	R	6 554	R	7 842	R	9 131	R	10 420
R5 255	R	2 913	R	4 226	R	5 540	R	6 854	R	8 167	R	9 481	R	10 795
R5 355	R	3 138	R	4 476	R	5 815	R	7 154	R	8 492	R	9 831	R	11 170

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): NORTH WEST BRITS														
	YIELD PRICE (R/TON)													
	R	4 794	R	4 894	R	4 994	R	5 094	R	5 194	R	5 294	R	5 394
2.75	-R	6 127	-R	5 852	-R	5 577	-R	5 302	-R	5 027	-R	4 752	-R	4 477
3.00	-R	4 929	-R	4 629	-R	4 329	-R	4 029	-R	3 729	-R	3 429	-R	3 129
3.25	-R	3 730	-R	3 405	-R	3 080	-R	2 755	-R	2 430	-R	2 105	-R	1 780
3.50	-R	2 532	-R	2 182	-R	1 832	-R	1 482	-R	1 132	-R	782	-R	432
3.80	-R	1 094	-R	714	-R	334	R	46	R	426	R	806	R	1 186
4.00	-R	135	R	265	R	665	R	1 065	R	1 465	R	1 865	R	2 265
4.25	R	1 063	R	1 488	R	1 913	R	2 338	R	2 763	R	3 188	R	3 613
4.50	R	2 261	R	2 711	R	3 161	R	3 611	R	4 061	R	4 511	R	4 961
4.75	R	3 460	R	3 935	R	4 410	R	4 885	R	5 360	R	5 835	R	6 310

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.
- 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.

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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: 2020	R/TON	R2 610	R5 235
Total deductions	R/TON	R335	R141
- Transport differential	R/TON	R266	R-
- Grade differential	R/TON	R-	R-
- Marketing & Handling	R/TON	R69	R141
Price premiums	R/TON	R-	R-
Net Farm Gate Price	R/TON	R2 275	R5 094
GROSS INCOME	R/HA	R27 297	R20 374
2) VARIABLE EXPENDITURES			
Contracting	R/HA	R-	R-
Crop insurance	R/HA	R1 638	R937
Fertilizer	R/HA	R6 443	R2 490
Lime	R/HA	R640	R-
Seed	R/HA	R3 585	R2 015
Fuel	R/HA	R1 143	R820
Herbicide	R/HA	R817	R780
Insecticide/Fungicide	R/HA	R456	R180
Marketing costs	R/HA	R-	R-
Repairs and maintenance	R/HA	R436	R471
Casual labour	R/HA	R197	R-
Aerial spray	R/HA	R-	R-
Irrigation Electricity	R/HA	R4 123	R2 967
Water	R/HA	R970	R698
Other expenditure: Scheduling / Irrigation Equipment R&M	R/HA	R372	R394
TOTAL VARIABLE EXPENDITURE	R/HA	R20 820	R11 752
TOTAL VARIABLE EXPENDITURE	R/TON	R1 735	R2 938
3.1) GROSS MARGIN:	R/HA	R6 477	R8 622
3.2) GROSS MARGIN:	R/TON	R540	R2 155
BREAK-EVEN YIELD	T/HA	9.15	2.31
BREAK-EVEN PRICE	R/TON	R1 735	R2 938

Source: BFAP, GSA & Individual Farmers, 2019

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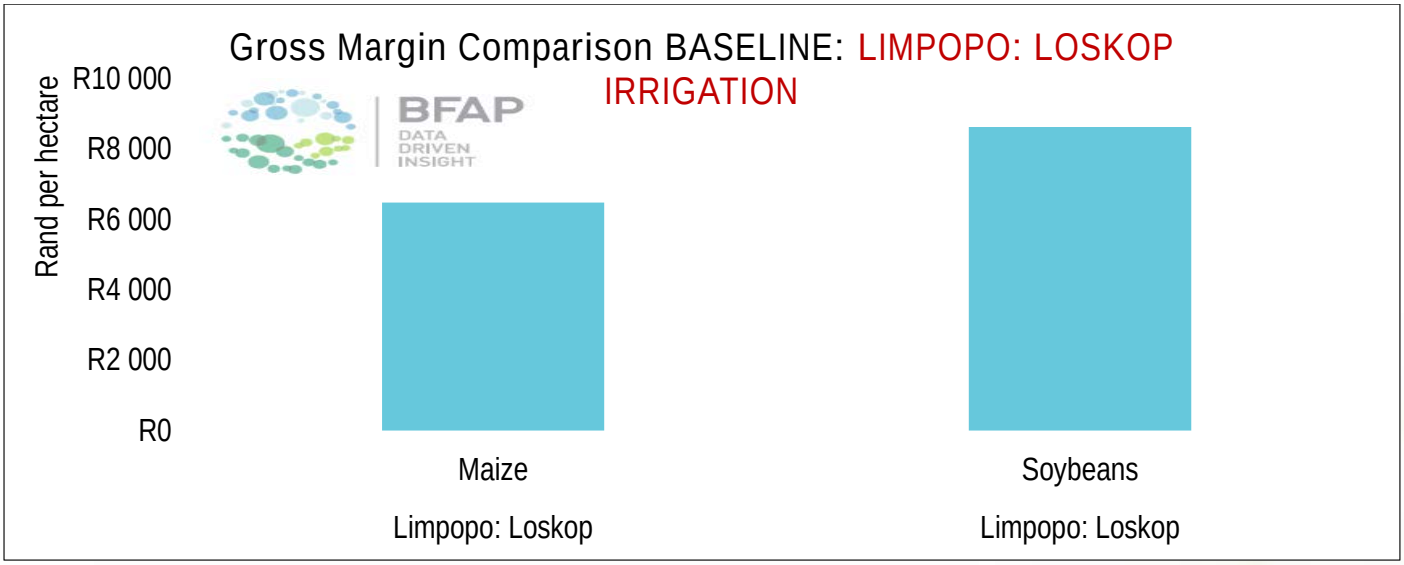


Figure 3.4: Gross margin comparison – Baseline: Limpopo: Loskop Region

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 875	-R 1 135	-R 198	R 740	R 1 677	R 2 615	R 3 552	R 4 489
R1 975	-R 85	R 902	R 1 890	R 2 877	R 3 865	R 4 852	R 5 839
R2 075	R 965	R 2 002	R 3 040	R 4 077	R 5 115	R 6 152	R 7 189
R2 175	R 2 015	R 3 102	R 4 190	R 5 277	R 6 365	R 7 452	R 8 539
R2 275	R 3 065	R 4 202	R 5 340	R 6 477	R 7 615	R 8 752	R 9 889
R2 375	R 4 115	R 5 302	R 6 490	R 7 677	R 8 865	R 10 052	R 11 239
R2 475	R 5 165	R 6 402	R 7 640	R 8 877	R 10 115	R 11 352	R 12 589
R2 575	R 6 215	R 7 502	R 8 790	R 10 077	R 11 365	R 12 652	R 13 939
R2 675	R 7 265	R 8 602	R 9 940	R 11 277	R 12 615	R 13 952	R 15 289

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
R4 694	R 3 502	R 4 675	R 5 848	R 7 022	R 8 195	R 9 369	R 10 542
R4 794	R 3 827	R 5 025	R 6 223	R 7 422	R 8 620	R 9 819	R 11 017
R4 894	R 4 152	R 5 375	R 6 598	R 7 822	R 9 045	R 10 269	R 11 492
R4 994	R 4 477	R 5 725	R 6 973	R 8 222	R 9 470	R 10 719	R 11 967
R5 094	R 4 802	R 6 075	R 7 348	R 8 622	R 9 895	R 11 169	R 12 442
R5 194	R 5 127	R 6 425	R 7 723	R 9 022	R 10 320	R 11 619	R 12 917
R5 294	R 5 452	R 6 775	R 8 098	R 9 422	R 10 745	R 12 069	R 13 392
R5 394	R 5 777	R 7 125	R 8 473	R 9 822	R 11 170	R 12 519	R 13 867
R5 494	R 6 102	R 7 475	R 8 848	R 10 222	R 11 595	R 12 969	R 14 342

SOYBEANS MARGIN ABOVE / BELOW MAIZE (GROSS MARGIN PER HECTARE): LIMPOPO: LOSKOP AREA

YIELD	PRICE (R/TON)						
	R 4 794	R 4 894	R 4 994	R 5 094	R 5 194	R 5 294	R 5 394
3.00	-R 3 849	-R 3 549	-R 3 249	-R 2 949	-R 2 649	-R 2 349	-R 2 049
3.25	-R 2 651	-R 2 326	-R 2 001	-R 1 676	-R 1 351	-R 1 026	-R 701
3.50	-R 1 452	-R 1 102	-R 752	-R 402	-R 52	R 298	R 648
3.75	-R 254	R 121	R 496	R 871	R 1 246	R 1 621	R 1 996
4.00	R 944	R 1 344	R 1 744	R 2 144	R 2 544	R 2 944	R 3 344
4.25	R 2 143	R 2 568	R 2 993	R 3 418	R 3 843	R 4 268	R 4 693
4.50	R 3 341	R 3 791	R 4 241	R 4 691	R 5 141	R 5 591	R 6 041
4.75	R 4 540	R 5 015	R 5 490	R 5 965	R 6 440	R 6 915	R 7 390
5.00	R 5 738	R 6 238	R 6 738	R 7 238	R 7 738	R 8 238	R 8 738

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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.
- 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.

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Summary: 2019/20 Income & Cost Budgets

Figures 4.1, 4.2 and 4.3 provide a summary on gross margins for dryland and irrigated summer crops for the 2019/20 production season. It further compares its performance against 2017/18 and 2018/19 deterministic gross margin levels.

Across the 24 dryland crops in 7 agro-ecological regions, an average gross margin of R4 506 per hectare is projected for the 2019/20 production season, approximately 10% lower compared to the same report from October 2018. The average production cost inflation over the same spectrum is calculated at 4.85% from the 2018/19 production season. From the recent analysis for the 2019/20 production season, the gross margin for soybean production in the Middelburg/Trichard region has ranked the highest across the 24 dryland crops followed by ground nuts in the Northern Free State and soybean in KwaZulu-Natal. However, as weather events in recent years proofed, it should be acknowledged that the environment can change rapidly and that the financial performance of each crop should be monitored on a continuous basis.

Figure 4.1 indicates the average dryland gross margin for maize, soybeans and sunflower for the 7 agro-ecological regions for 2017/18, 2018/19 and 2019/20. Under normal weather conditions in 2019/20, the gross margin for soybeans is projected to outperform maize where sunflower is projected marginally higher than soybeans. Figure 4.2 disseminates the gross margins into regions where Figure 4.3 represents the performance of irrigated crops.

In figure 4.4, an attempt was made to change the deterministic (targeted) yields to actual yields for the 2017/18 and 2018/19 season where 2018 regional yields were considered and for 2019, the yield deviation as is stipulated in the 8th production forecast by the crop estimates committee. The "actual or estimated" gross margins are compared to the projections for the 2019/20 production season under normal weather conditions, hence achieving targeted yields. For maize, a relative sideways gross margin is projected for the 2019/20 production season when compared to the 2018/19 season. Soybeans is projected 37% higher where sunflower is projected to increase by 29%.

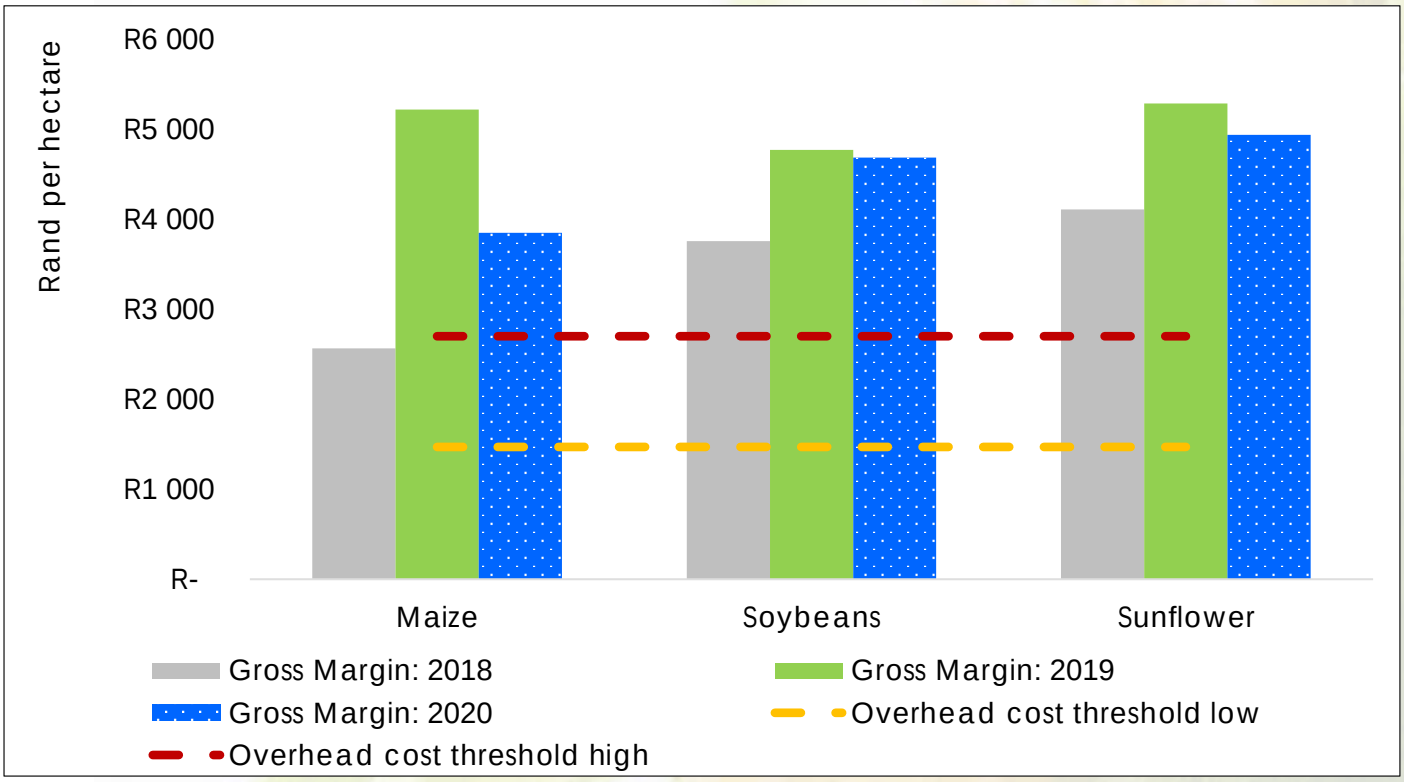


Figure 4.1: Dryland - Deterministic gross margin comparison: 2017/18, 2018/19 & 2019/20

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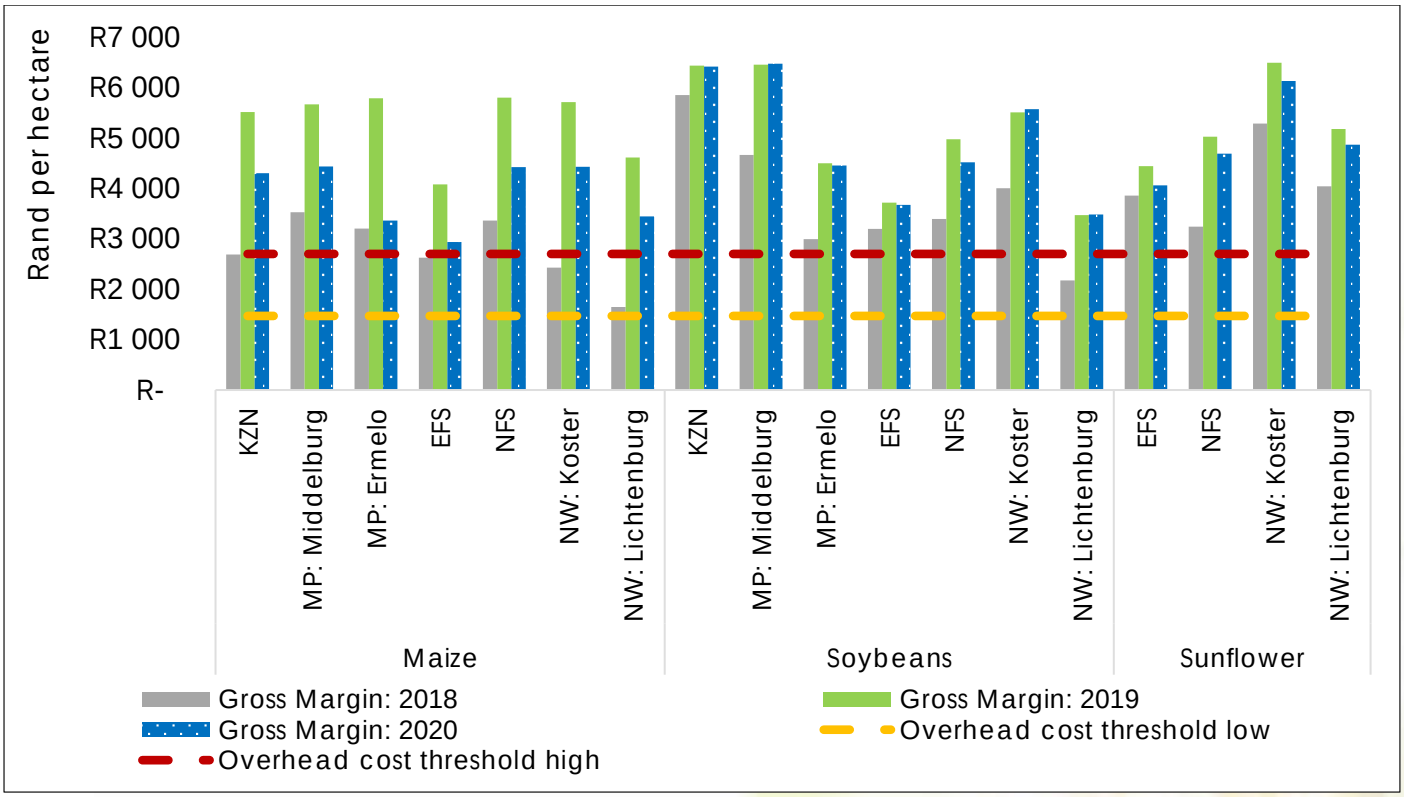


Figure 4.2: Dryland - Deterministic regional gross margin comparison: 2017/18, 2018/19 & 2019/20

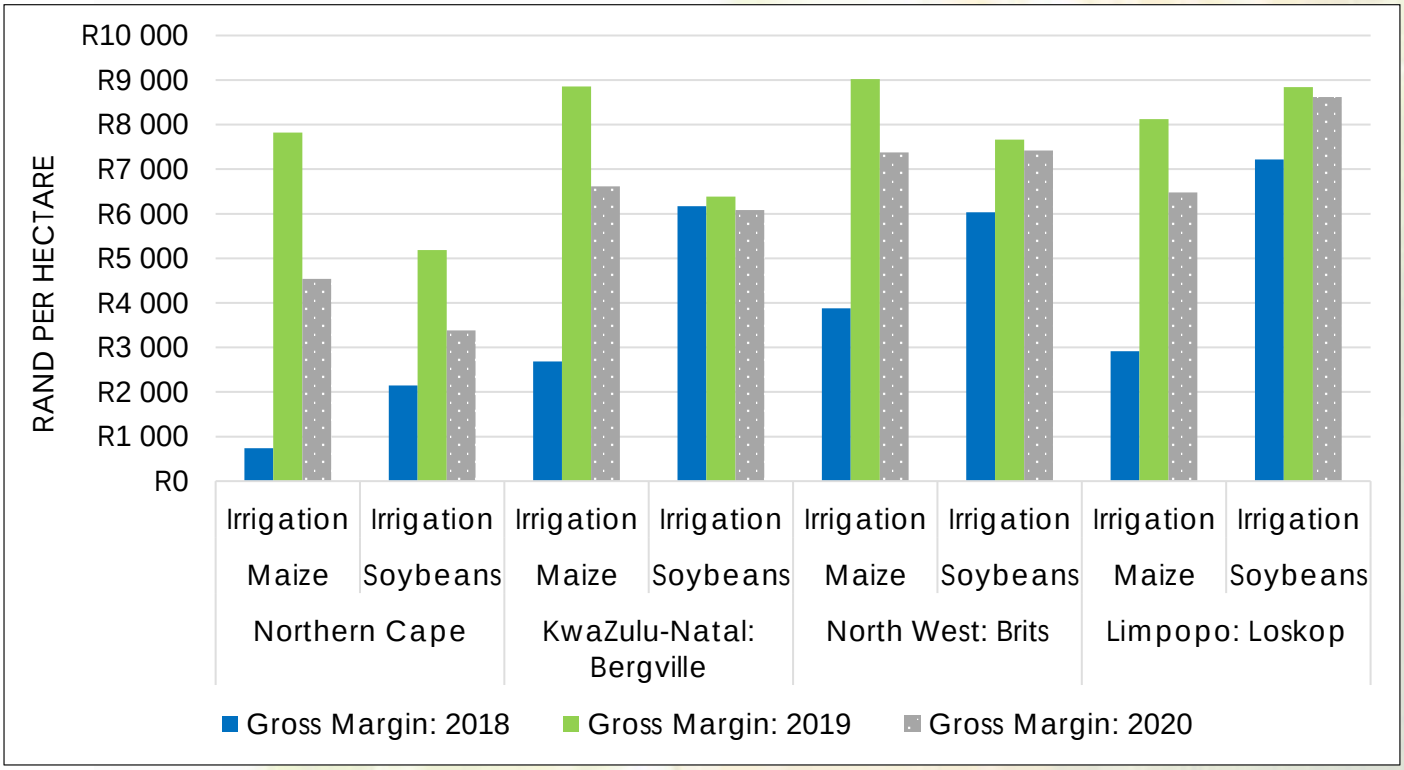


Figure 4.3: Irrigation - Deterministic regional gross margin comparison: 2017/18, 2018/19 & 2019/20

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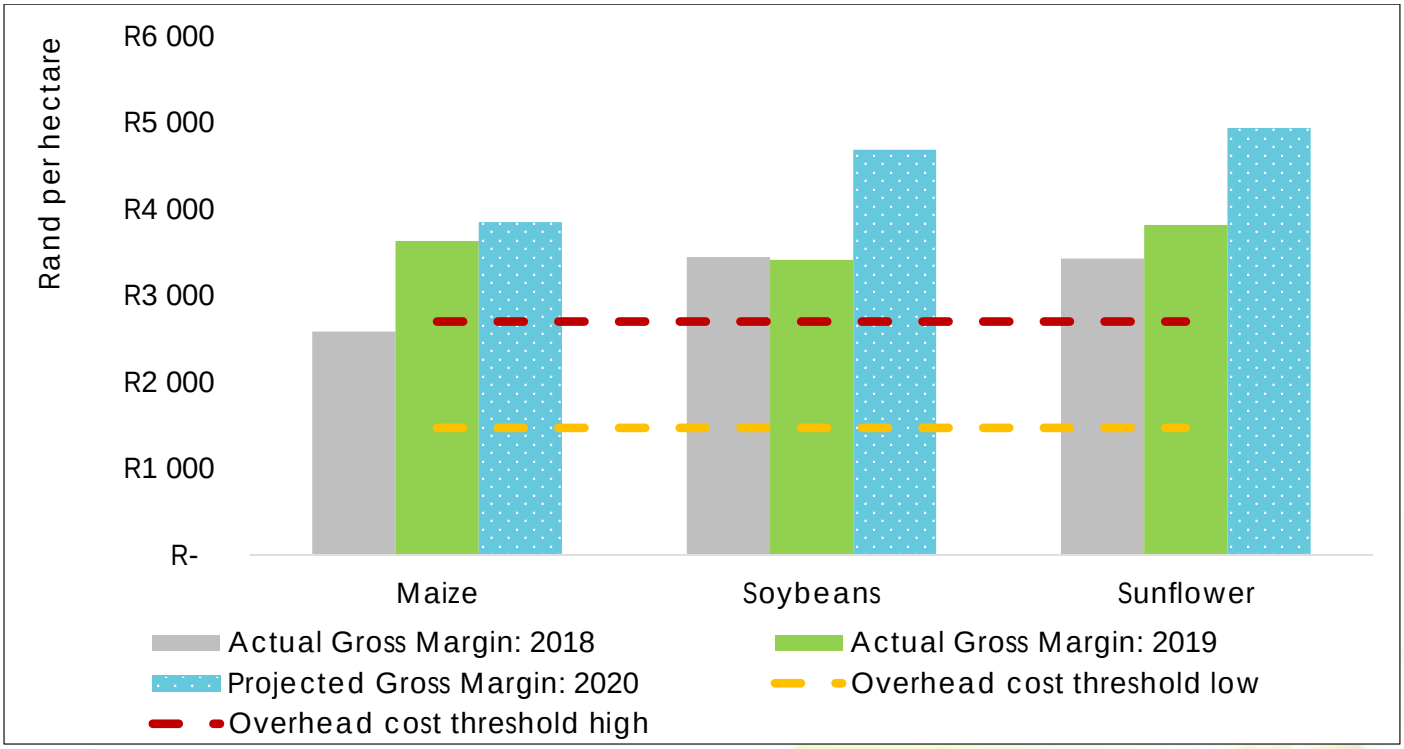


Figure 4.4: Dryland - Gross margin comparison: Actuals (adjusted for actual 2018 & 2019 yields) & projections for 2019/20

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