

CONTRASTS







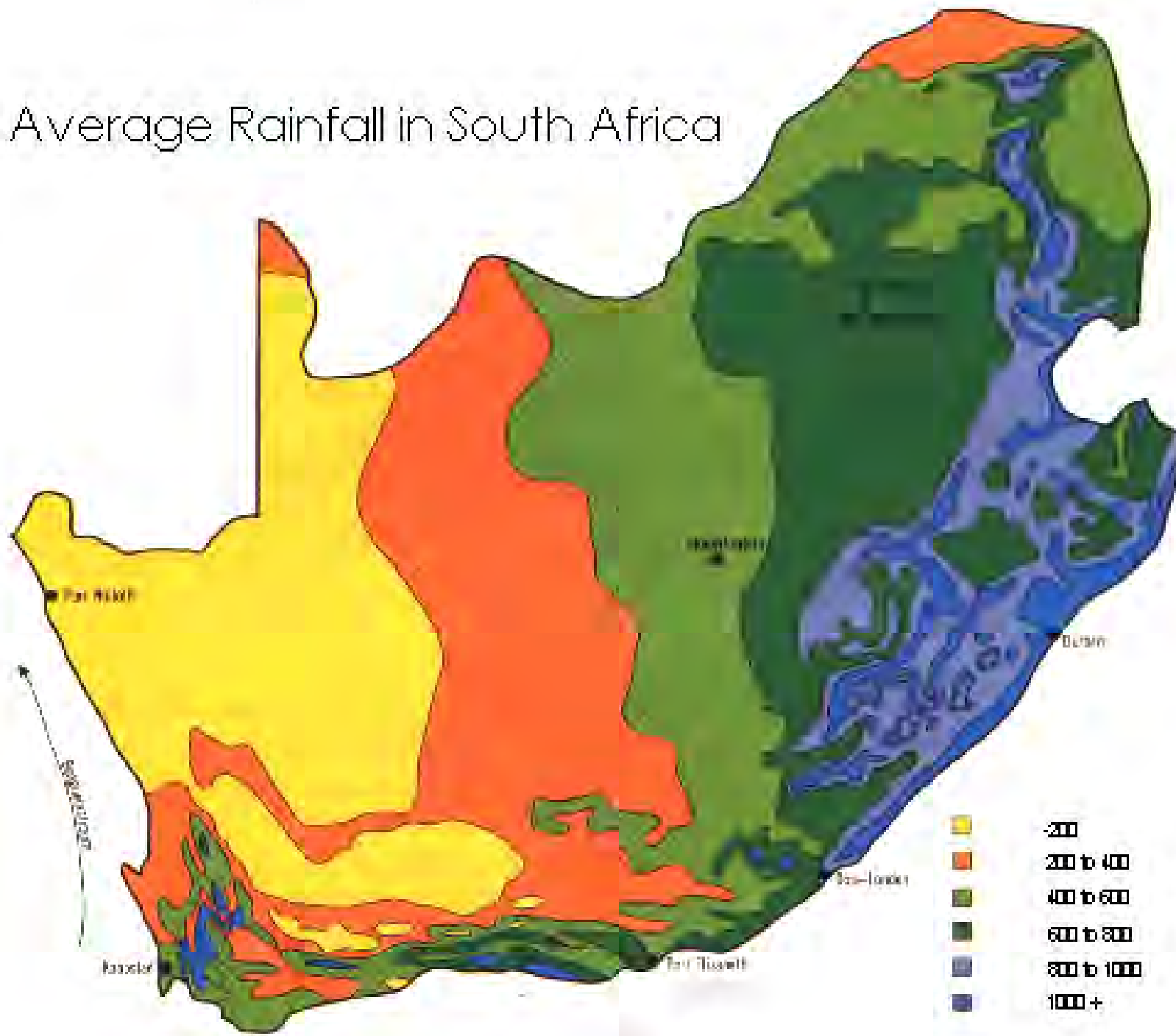


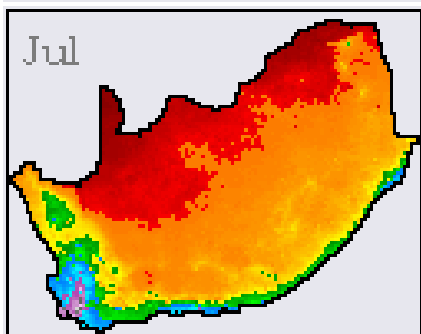
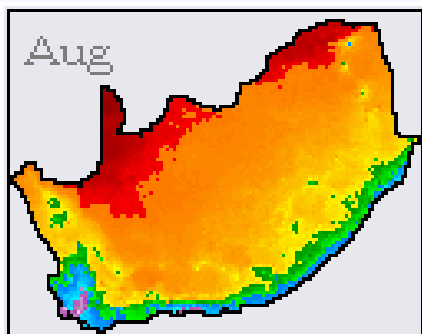
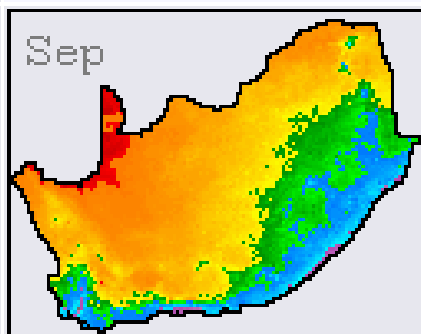
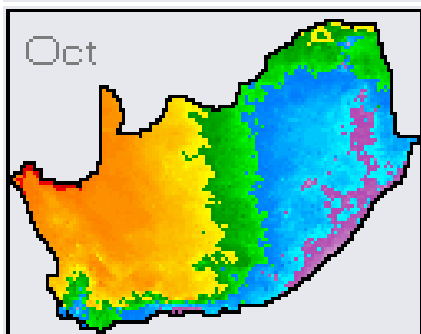
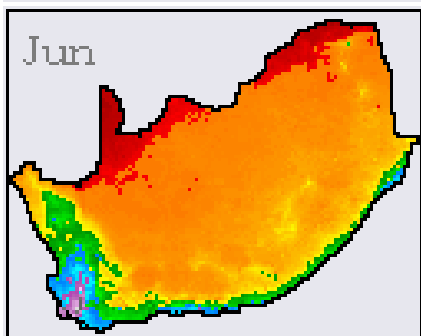
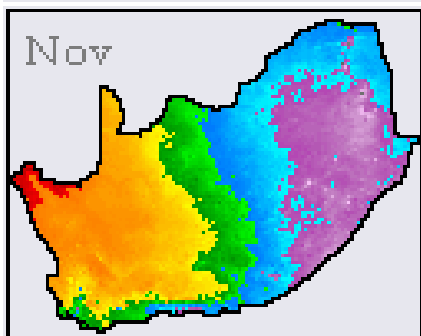
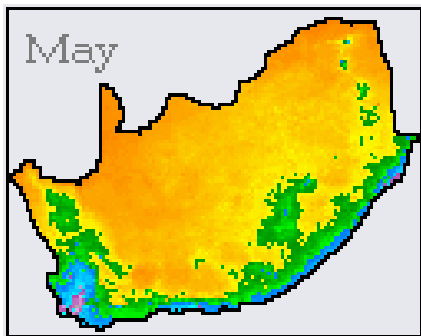
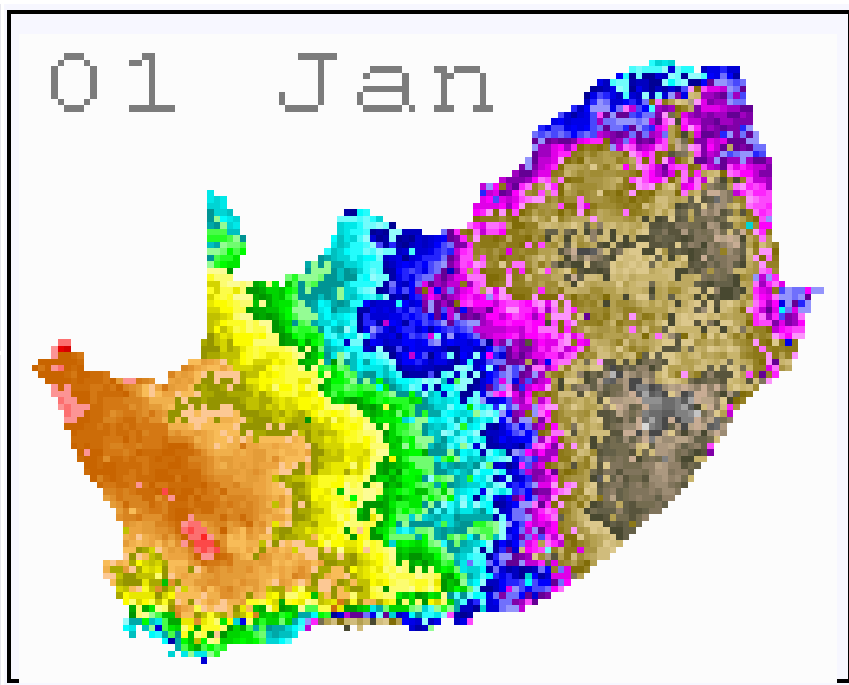
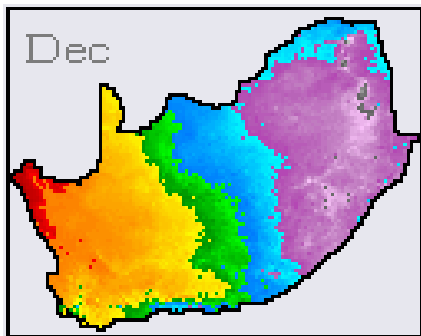
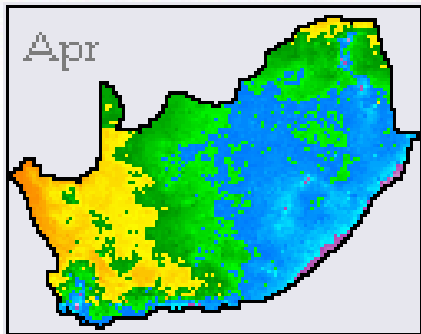
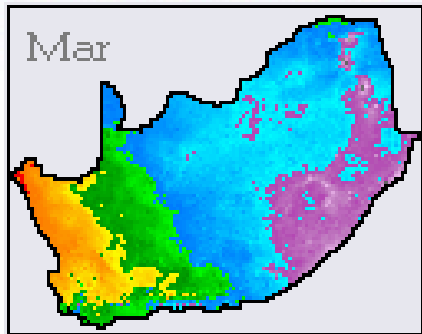
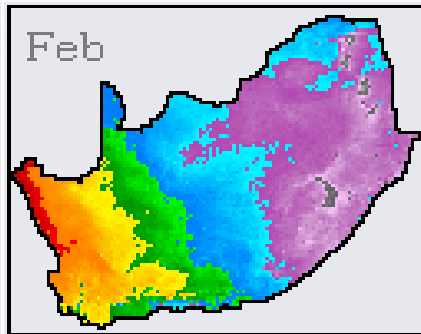
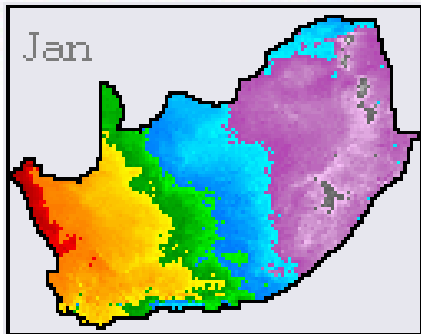




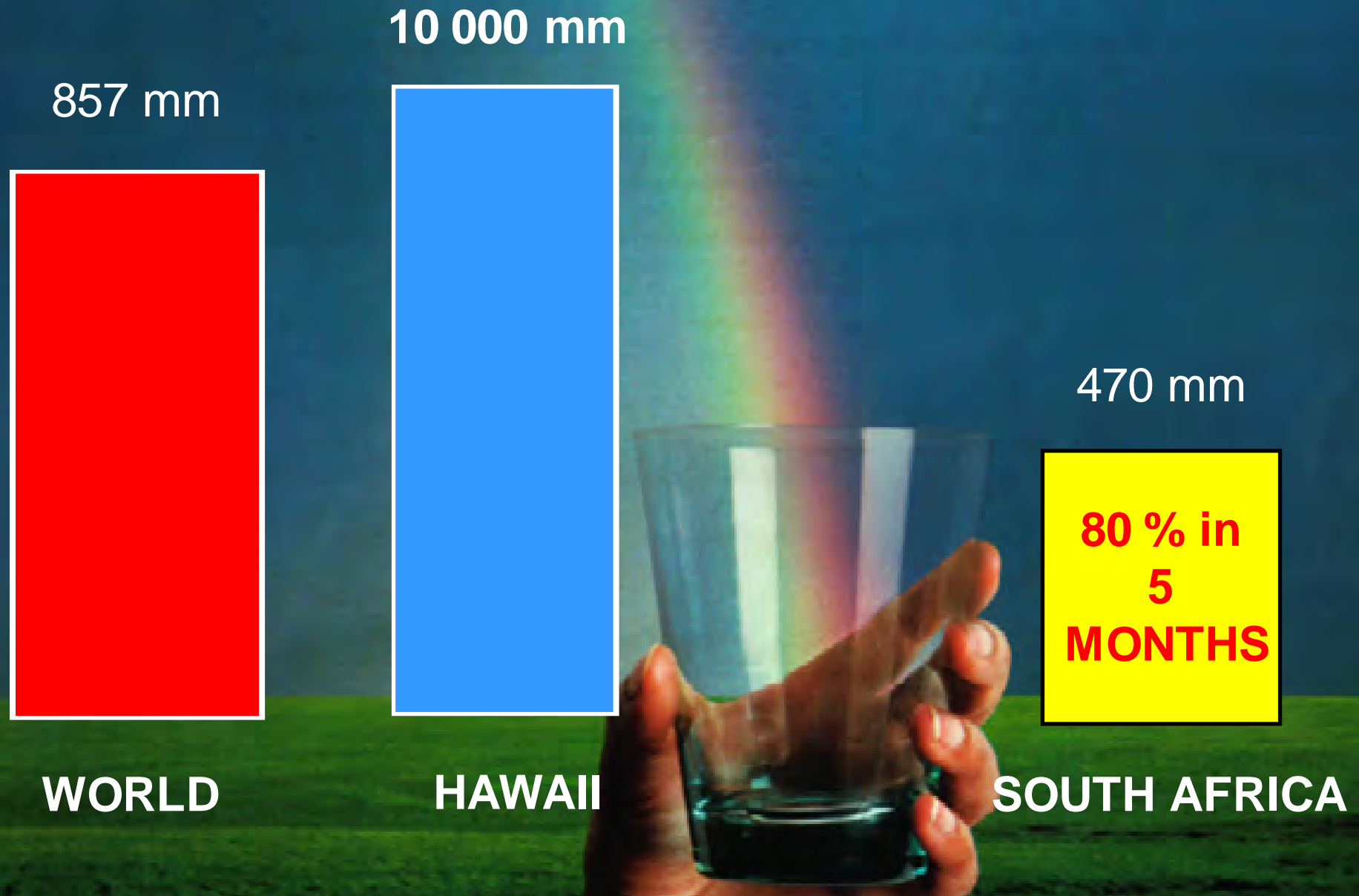


Average Rainfall in South Africa





ANNUAL RAINFALL



ANNUAL RAINFALL

SOUTH AFRICA

Receive $110\,000 \times 10^6 \text{ m}^3$ **rain**

$70\,000 \times 10^6 \text{ m}^3$ **evaporate**

Use $12\,871 \times 10^6 \text{ m}^3$



RSA Water Resources

- **The Orange River carries about 10% of the flow of the Zambezi River and about 1% of the flow in the Congo.**
- **The total surface runoff of 40 000 million m³ of all the RSA rivers added together is less than half of the MAR of the Zambezi River.**
- **In the year 2000, 12 of the 19 water management areas in the country faced a deficit.**
- **We have to share many of our larger rivers with other countries.**

National water act (Act 36 of 1998)

Dictates water has to be

**protected
used
developed
conserved
managed and
controlled**

in a sustainable and equitable manner.



19 WATER MANAGEMENT AREAS AND PROVINCIAL BOUNDARIES OF SOUTH AFRICA



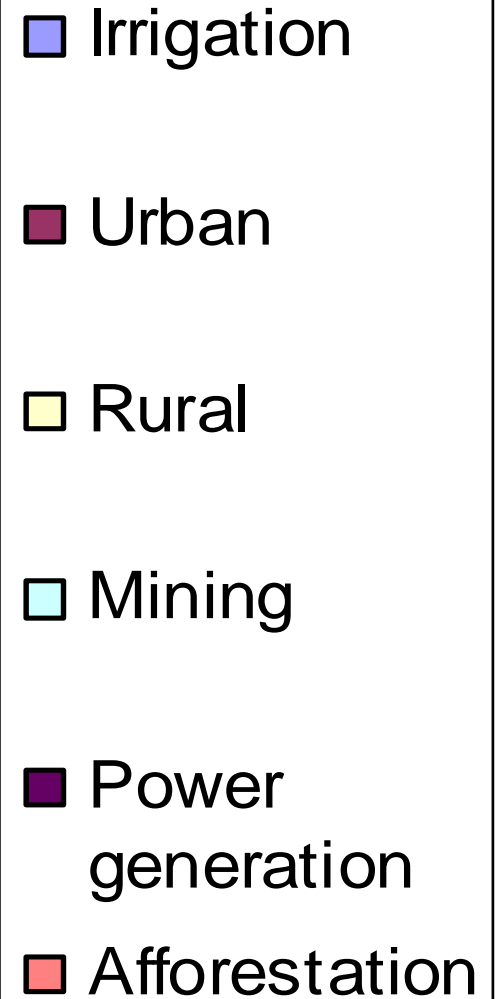
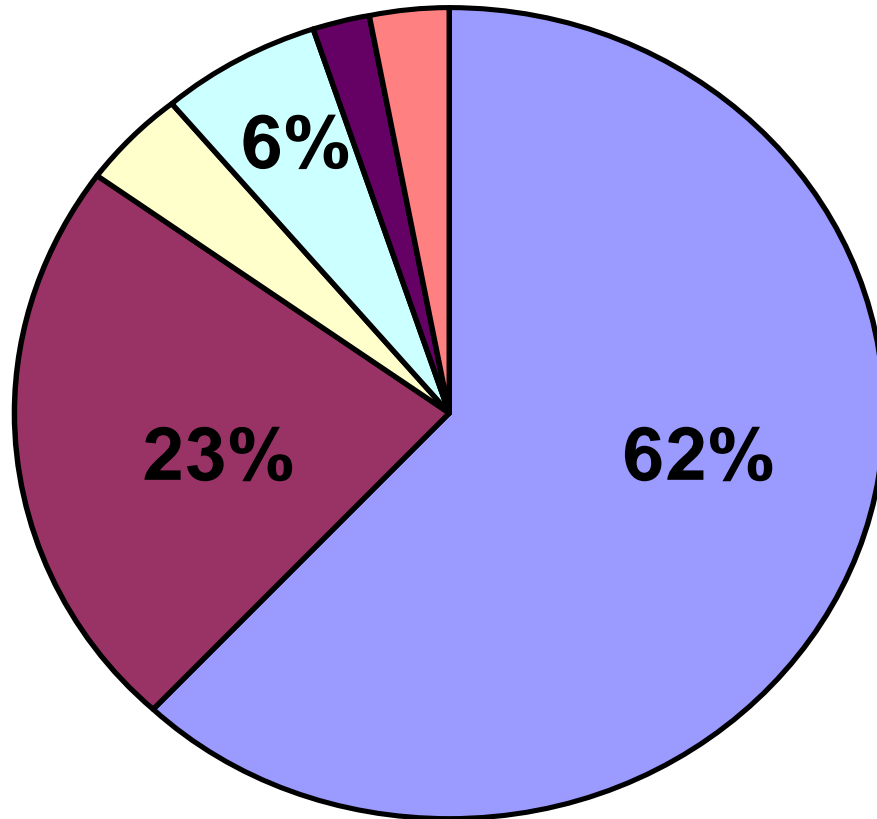
Water Management Areas-Water yield, total and irrigation requirements-Mm³/a- Year 2000

NO	AREA	TOTAL LOCAL YIELD	TOTAL LOCAL REQUIREMENTS	IRRIGATION
1	Limpopo	281	322	238
2	Luvuvhu and Letaba	310	333	248
3	Crocodile and Marico	718	1184	445
4	Olifants	609	965	557
5	Inkomati	896	845	593
6	Usutu to Mhlatuze	1110	717	432
7	Thukela	737	334	204
8	Upper Vaal	1132	1045	114
9	Middle Vaal	49	370	159
10	Lower Vaal	125	643	525
11	Mvoti to Umzimkhulu	523	797	207
12	Mzimvubu to Keiskamma	854	374	190
13	Upper Orange	4447	968	780
14	Lower Orange	-961	1028	977
15	Fish to Tsitsikama	423	901	765
16	Gouritz	275	337	254
17	Olifants/Doorn	335	373	356
18	Breede	864	632	576
19	Berg	482	704	301



Water use in SA in 2000

Water Use in the RSA



Production of commodities in South Africa

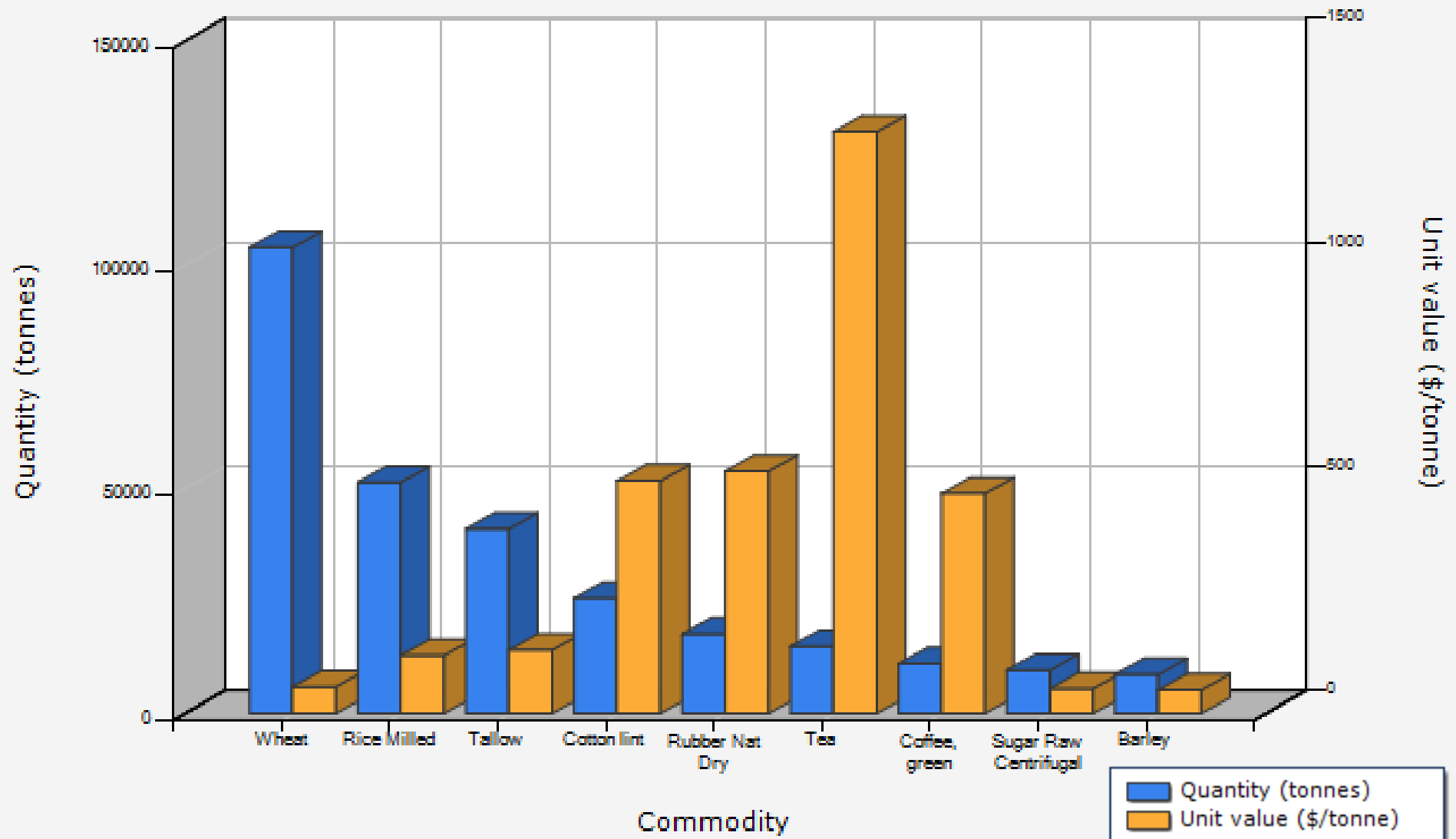
Rank	Commodity	1961	Production (int. & local) Footnote	Production (MT) Footnote	Rank	Commodity	1981	Production (int. & local) Footnote	Production (MT) Footnote
1	Indigenous Lamb Meat	718 344	C	748 000	1	Wheat	1 738 109	C	14 870 000
2	Low Milk/Wool/Fresh	666 052	C	2 557 100	2	Indigenous Lamb Meat	666 229	C	674 640
3	Wool	615 310	C	6 281 600	3	Coastal/Whole Fresh	604 858	C	2 581 600
4	Wool/Fresh	248 187	C	122 800	4	Citrus	478 438	C	1 671 440
5	Potatoes	229 828	C	916 650	5	Sugar Cane	405 682	C	19 800 130
6	Indigenous Sheep Meat	207 784	C	1 016 500	6	Wheat	387 488	C	2 258 000
7	Sugar Cane	188 815	C	6 242 600	7	Indigenous Chicken Meat	264 023	C	1 081 600
8	Wheat	178 458	C	878 000	8	Indigenous Sheep Meat	249 792	C	1 781 000
9	Groundnuts/Other	138 847	C	1 881 000	9	Wool/Woolley	178 301	C	1 016 600
10	Oranges	122 292	C	1 021 900	10	Groundnuts (Shell)	109 622	C	1 321 900

Rank	Commodity	1995	Production (int. & local) Footnote	Production (MT) Footnote	Rank	Commodity	2005	Production (int. & local) Footnote	Production (MT) Footnote
1	Indigenous Lamb Meat	668 886	C	668 886	1	Wheat	1 222 935	C	11 825 000
2	Low Milk/Wool/Fresh	1 143 031	C	2 374 000	2	Indigenous Lamb Meat	1 210 220	C	1 021 480
3	Indigenous Chicken Meat	688 810	C	681 272	3	Indigenous Chicken Meat	1 077 848	C	1 118 600
4	Citrus	630 362	C	1 582 820	4	Citrus	748 871	C	1 715 600
5	Wool	605 433	C	4 808 600	5	Low Milk/Wool/Fresh	878 872	C	2 652 000
6	Sugar Cane	387 143	C	18 170 650	6	Sugar Cane	481 229	C	21 125 000
7	Wheat	308 811	C	1 891 204	7	Wheat	478 910	C	2 204 600
8	Van Elix	178 000	C	1 281 000	8	Van Elix	388 818	C	1 121 000
9	Potatoes	208 771	C	1 421 800	9	Potatoes	278 908	C	1 898 000
10	Indigenous Sheep Meat	188 875	C	1 816 600	10	Apples	228 838	C	1 771 000

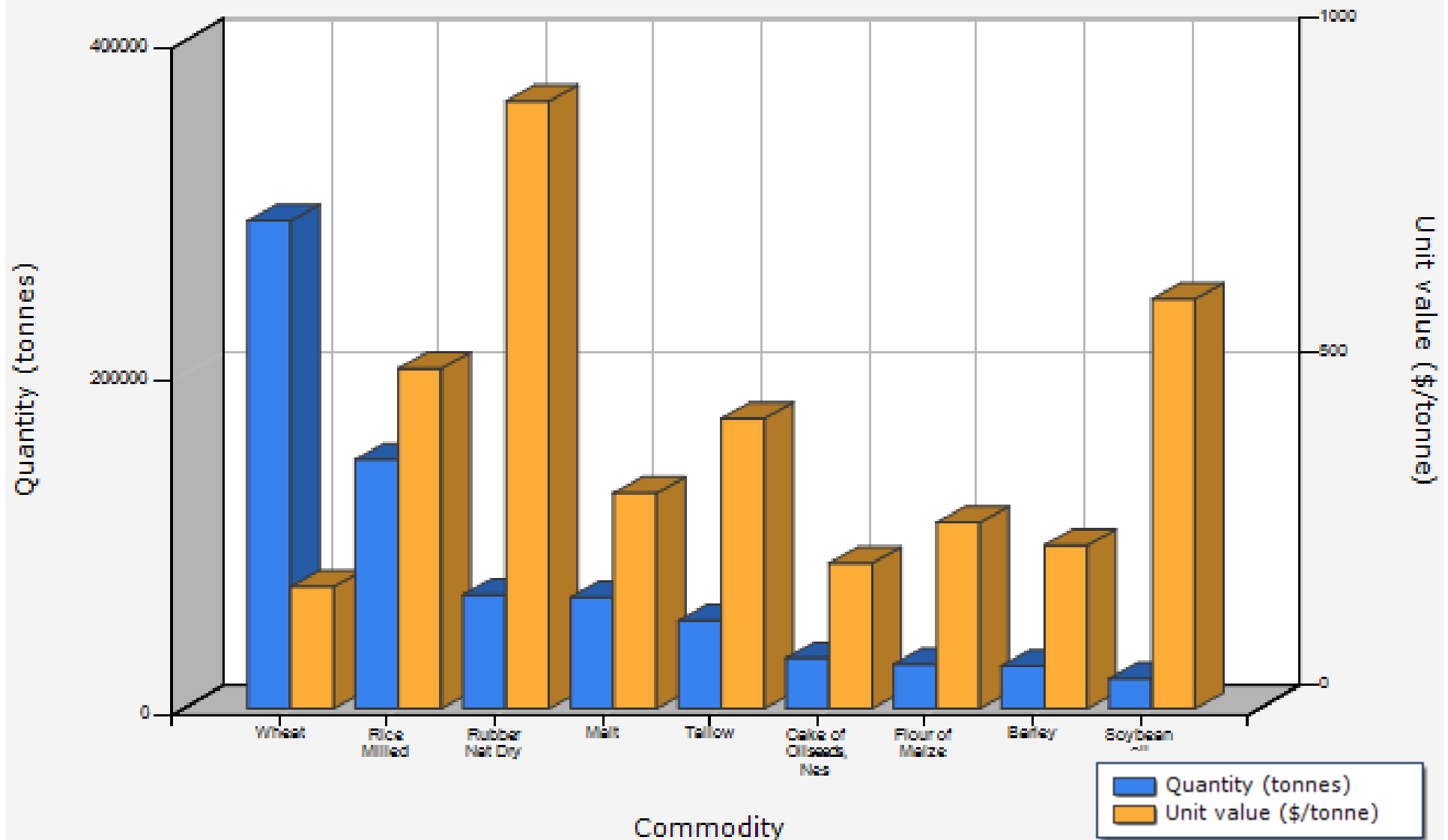
Commodities in SA compared to the World

Rank	1961	1981	1995	2007			
→ 4	Maize	→ 2	Maize	6	Maize, green	→ 3	Grapefruit (inc. pomelos)
5	Buckwheat	→ 6	Grapefruit (inc. pomelos)	6	Cereals, nes	7	Cereals, nes
5	Sunflower seed	6	Maize, green	→ 7	Grapefruit (inc. pomelos)	8	Maize, green
6	Wool, greasy	6	Wool, greasy	8	Wool, greasy	8	Pears
→ 7	Grapefruit (inc. pomelos)	8	Sunflower seed	10	Apricots	10	Castor oil seed
7	Maize, green	8	Cereals, nes	11	Grapes	10	Grapes
8	Pineapples	9	Buckwheat	11	Avocados	11	Nuts, nes
9	Lupins	10	Groundnuts, with shell	11	Castor oil seed	12	Wool, greasy
9	Cow peas, dry	11	Sorghum	11	Pears	13	Oranges
9	Peaches and nectarines	11	Lupins	11	Peaches and nectarines	13	Indigenous Cattle Meat
10	Oranges	11	Cow peas, dry	12	Pumpkins, squash and gourds	13	Lupins
11	Castor oil seed	11	Pumpkins, squash and gourds	12	Lupins	13	Buckwheat
11	Groundnuts, with shell	11	Pineapples	12	Sunflower seed	13	Sugar cane
11	Cereals, nes	12	Peaches and nectarines	14	Buckwheat	13	Lemons and limes
12	Berries Nes	12	Castor oil seed	14	Sugar cane	14	Other Bastfibres
12	Other Bastfibres	13	Sugar cane	14	Other Bastfibres	15	Peaches and nectarines
12	Indigenous Sheep Meat	13	Apricots	14	Indigenous Goat Meat	15	Sunflower seed
13	Sorghum	13	Pears	15	Oranges	→ 15	Maize
13	Indigenous Cattle Meat	13	Berries Nes	17	Indigenous Chicken Meat	15	Avocados
13	Indigenous Goat Meat	13	Other Bastfibres	→ 17	Maize	16	Apples
14	Sugar cane	13	Indigenous Sheep Meat	17	Cow peas, dry	16	Indigenous Sheep Meat
14	Pumpkins, squash and gourds	14	Oranges	18	Asparagus	16	Indigenous Chicken Meat
15	Oilseeds, Nes	15	Oats	18	Tea	18	Cow peas, dry
15	Papayas	15	Grapes	19	Lemons and limes	18	Apricots
16	Oats	15	Indigenous Goat Meat	19	Pineapples	19	Tangerines, mandarins, clem.

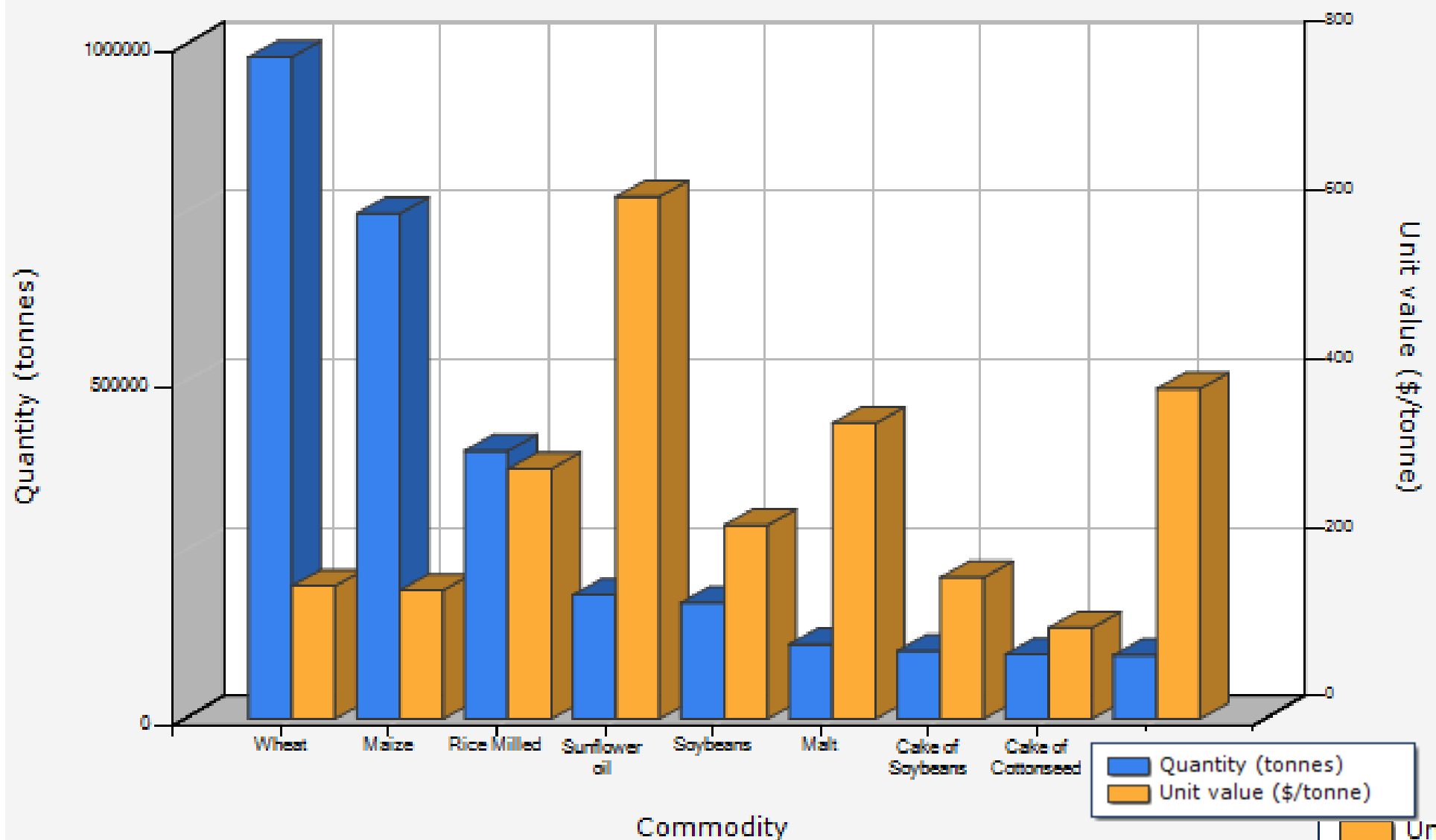
Top imports – South Africa -1961



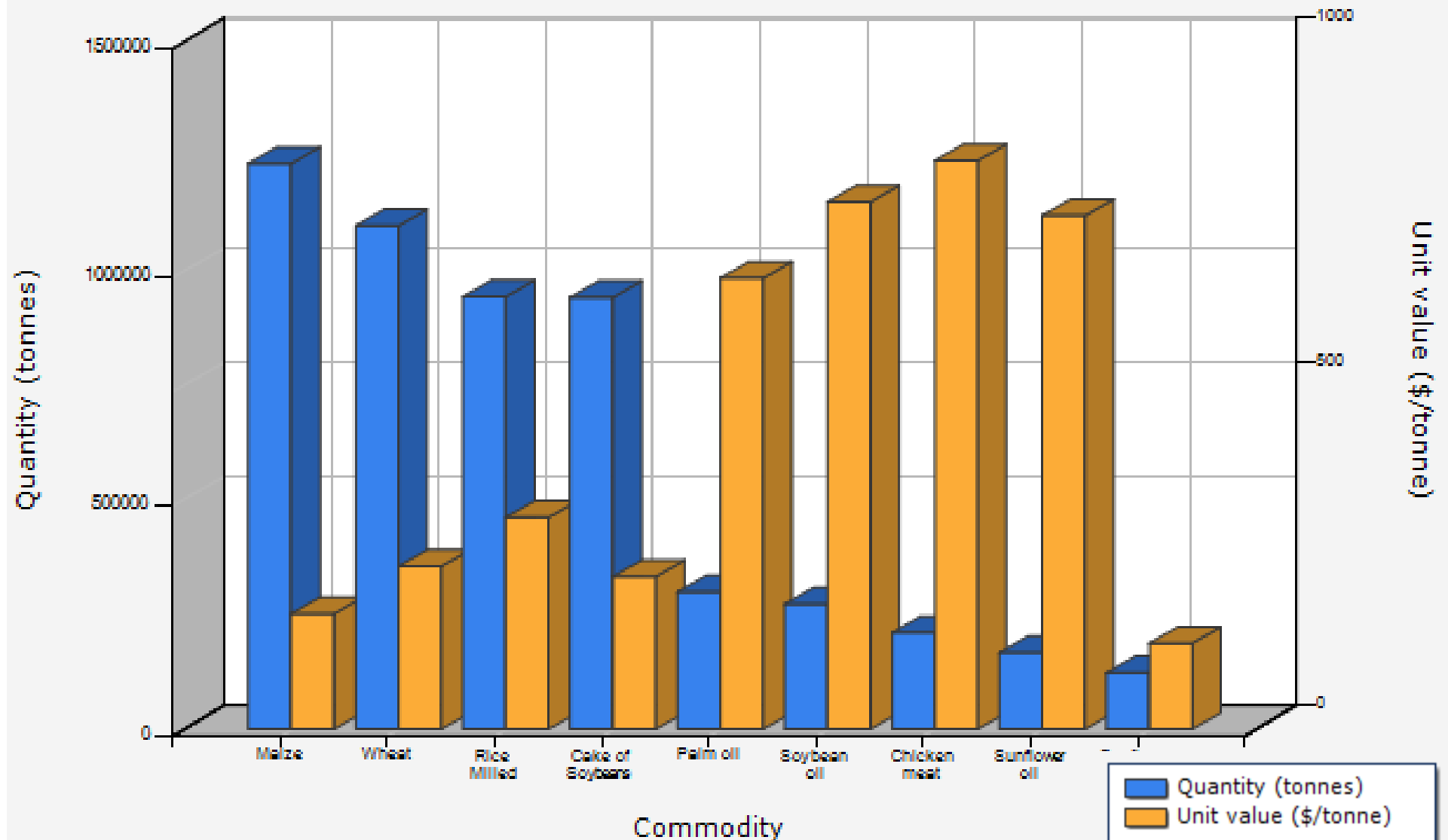
Top imports – South Africa -1981



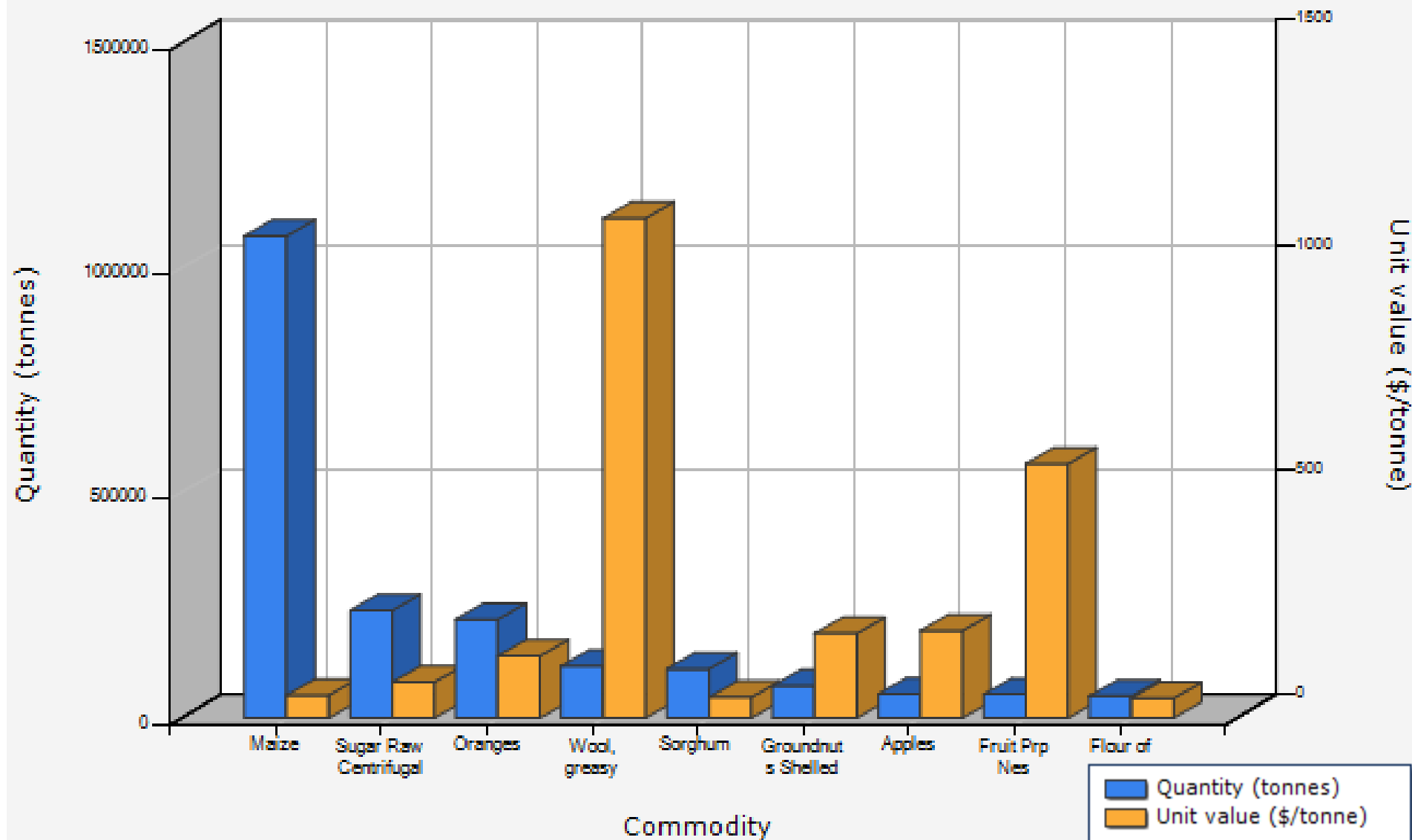
Top imports – South Africa -1995



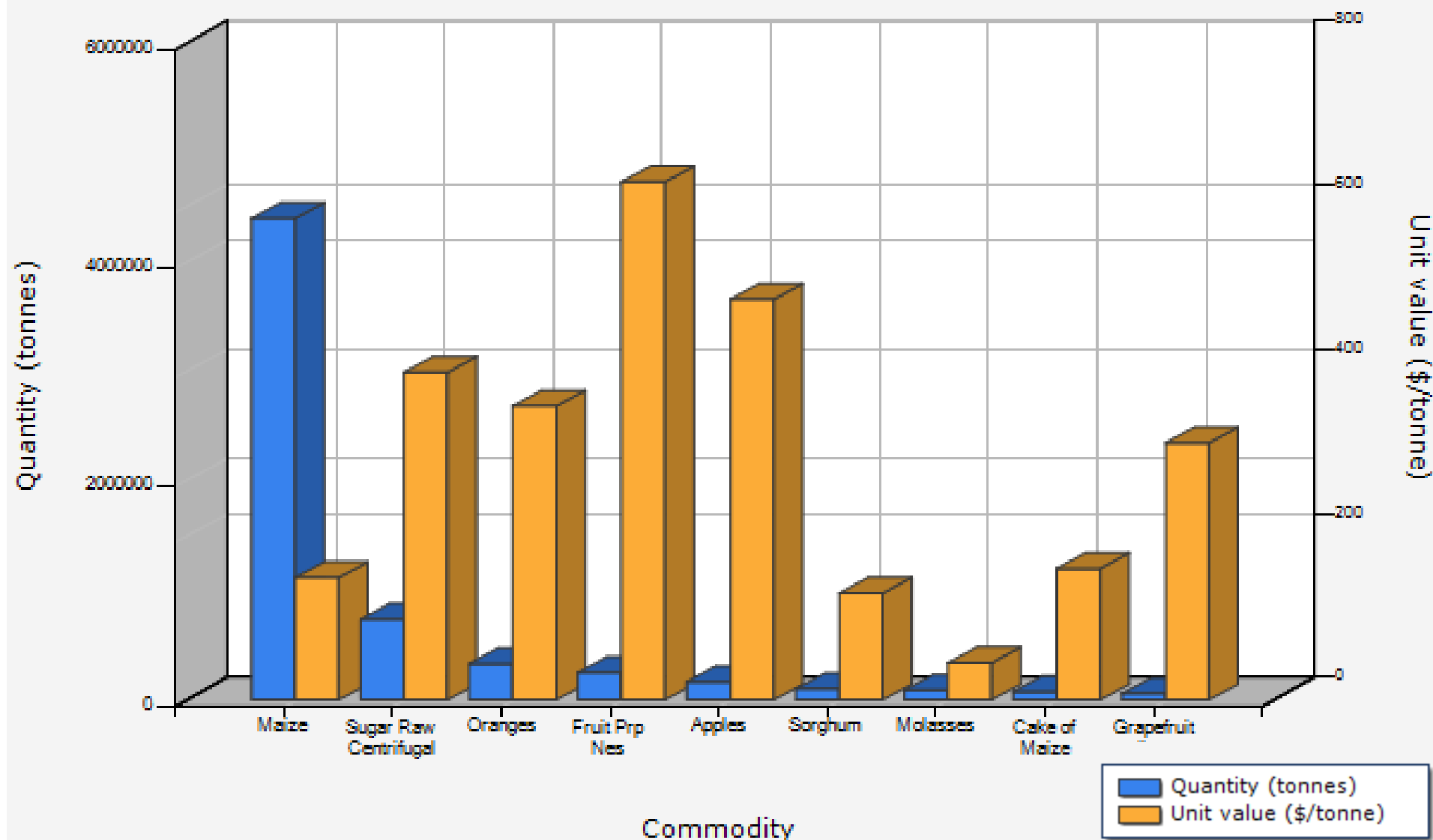
Top imports –South Africa -2007



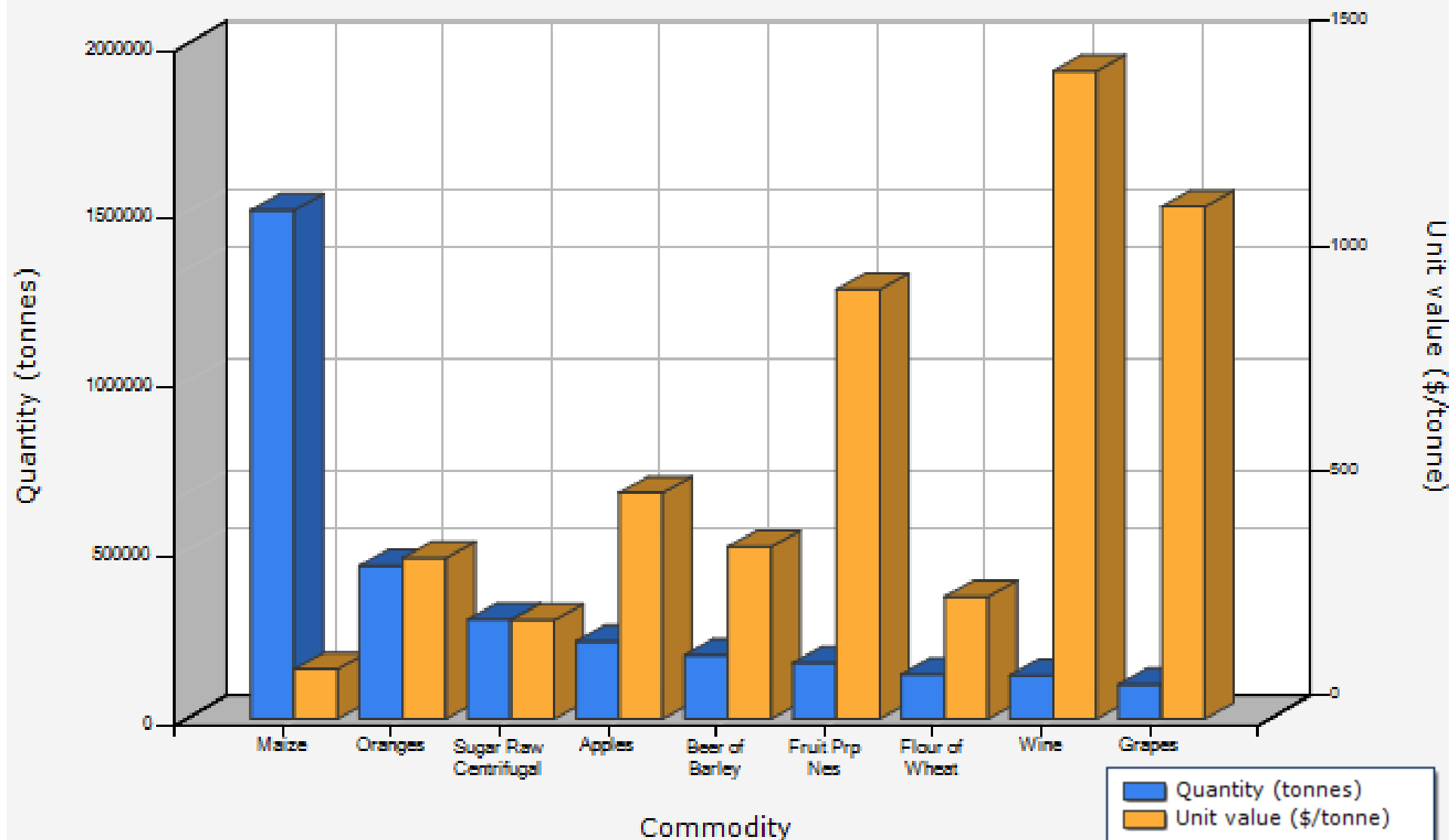
Top exports –South Africa -1961



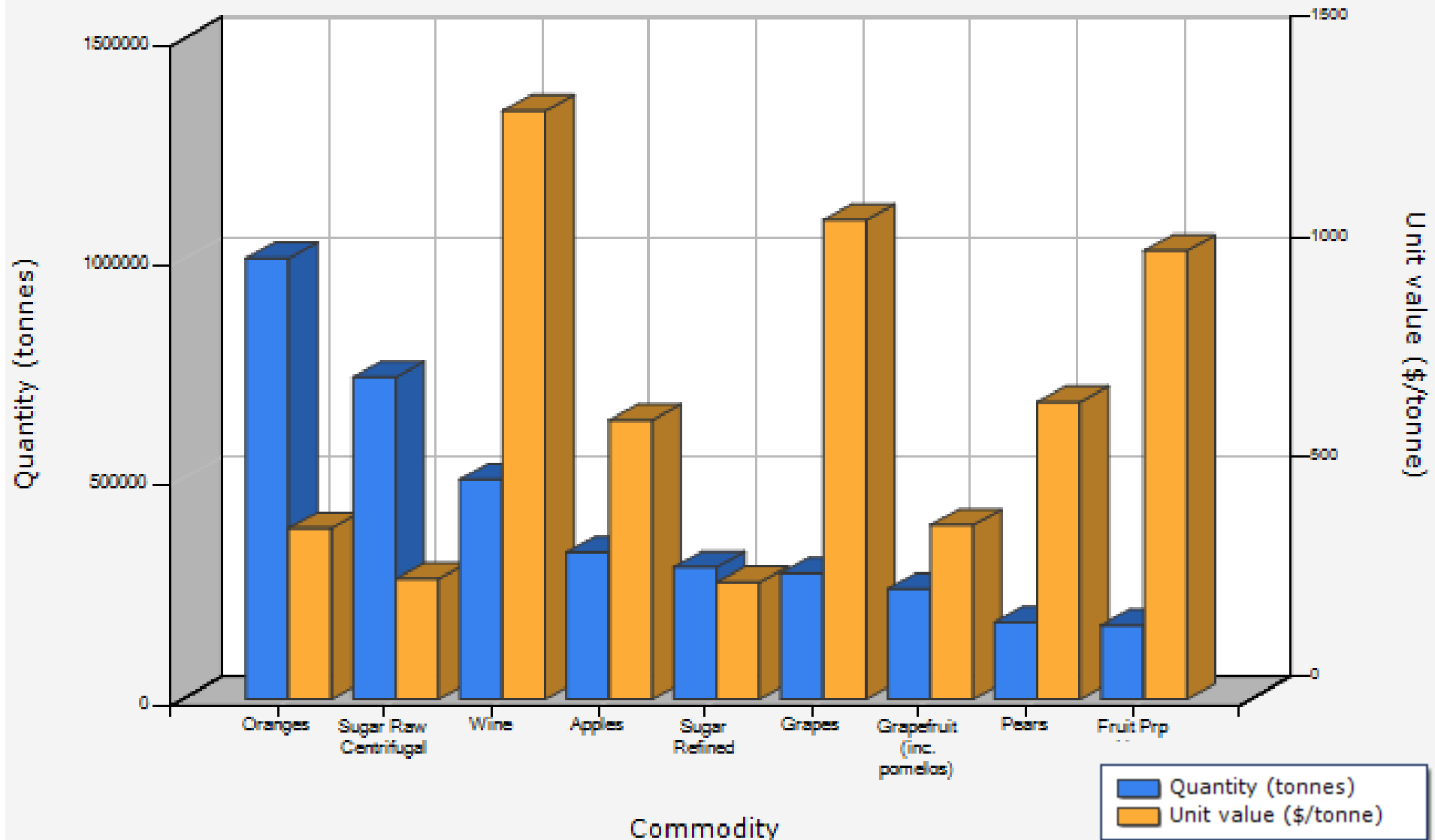
Top exports –South Africa -1981



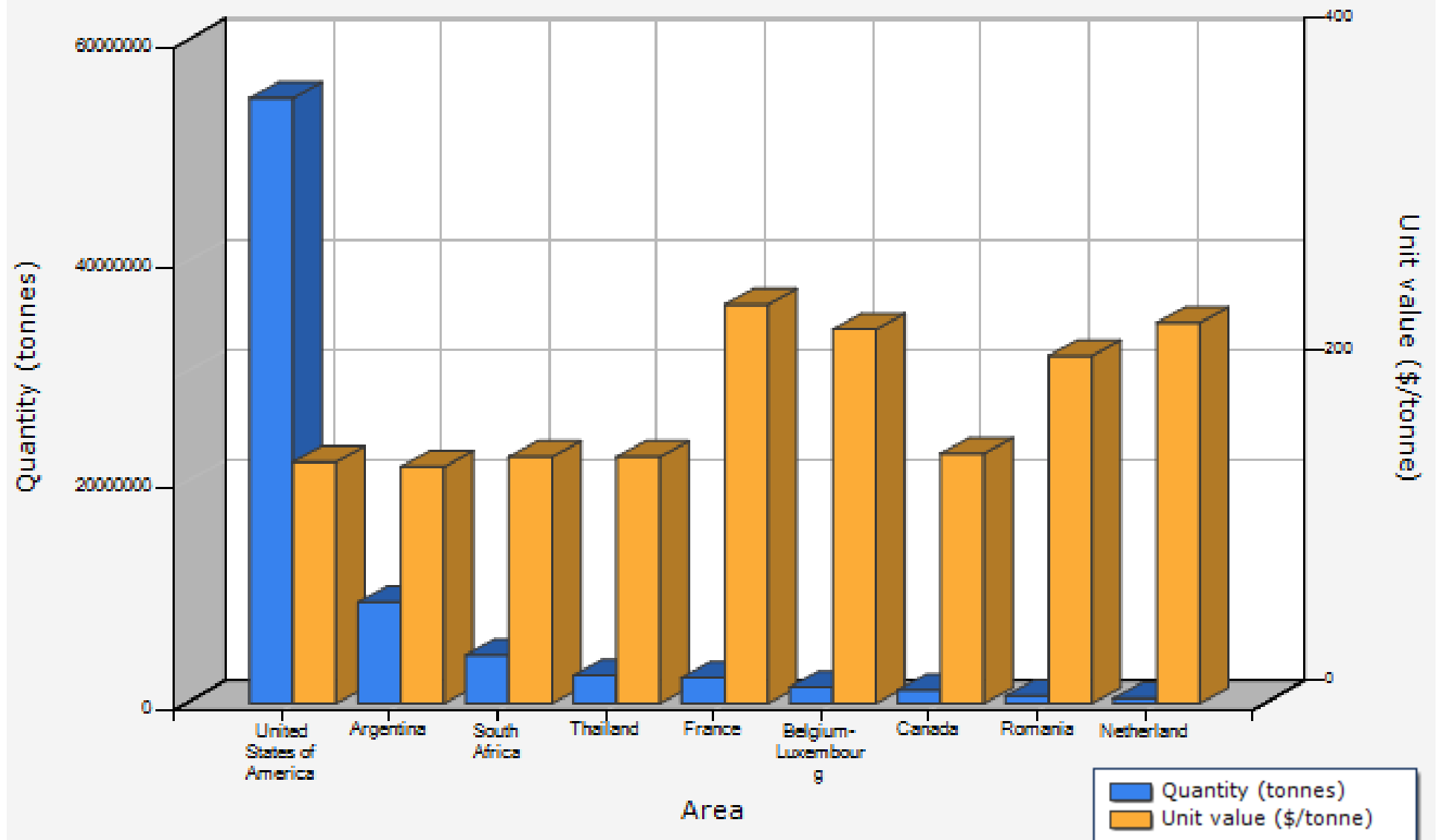
Top exports –South Africa -1995



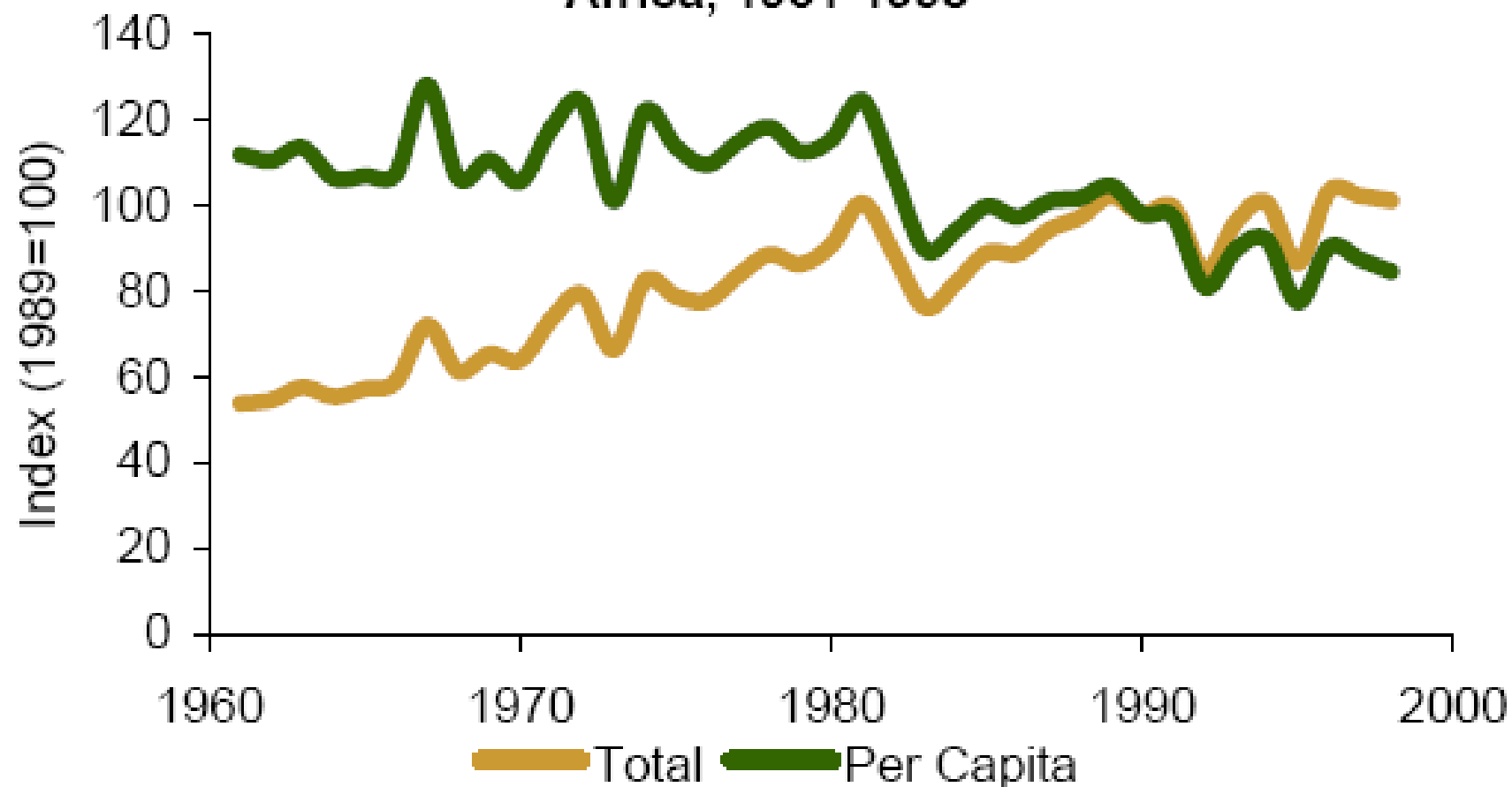
Top exports –South Africa -2007



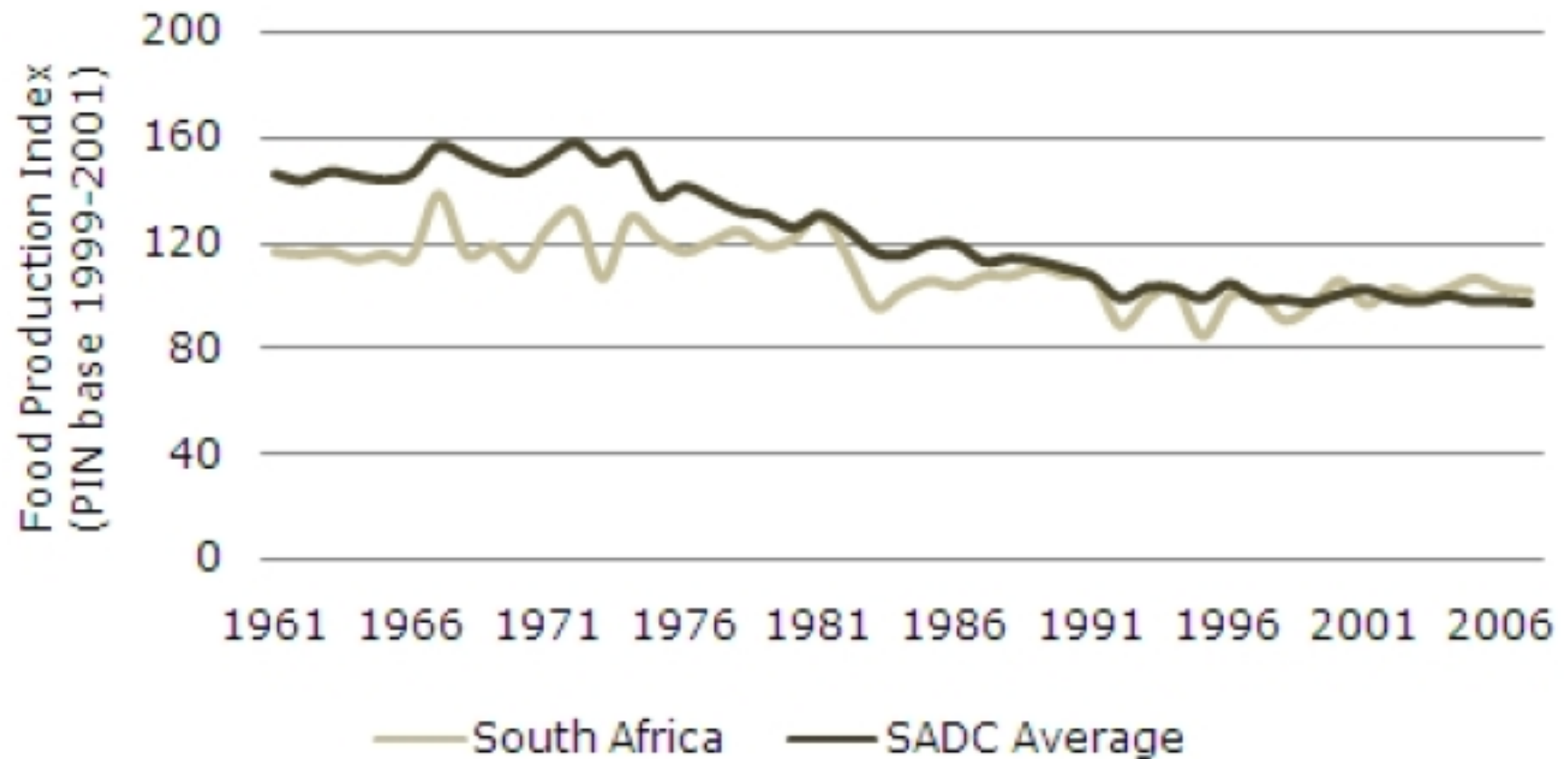
Top exports –Maize-1981



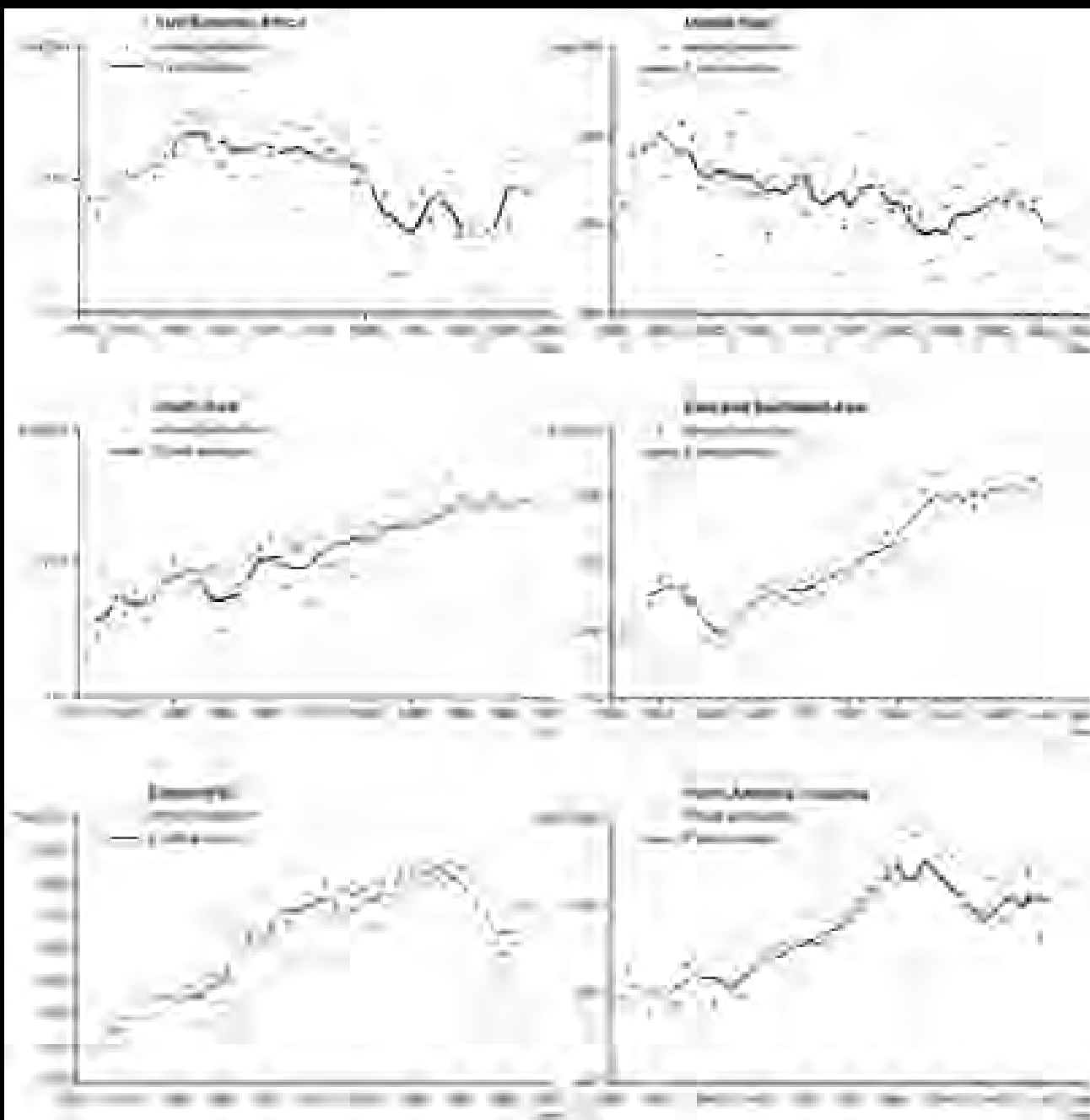
Index of Total and Per Capita Food Production, South Africa, 1961-1998



Challenge to South Africa to maintain food self sufficiency

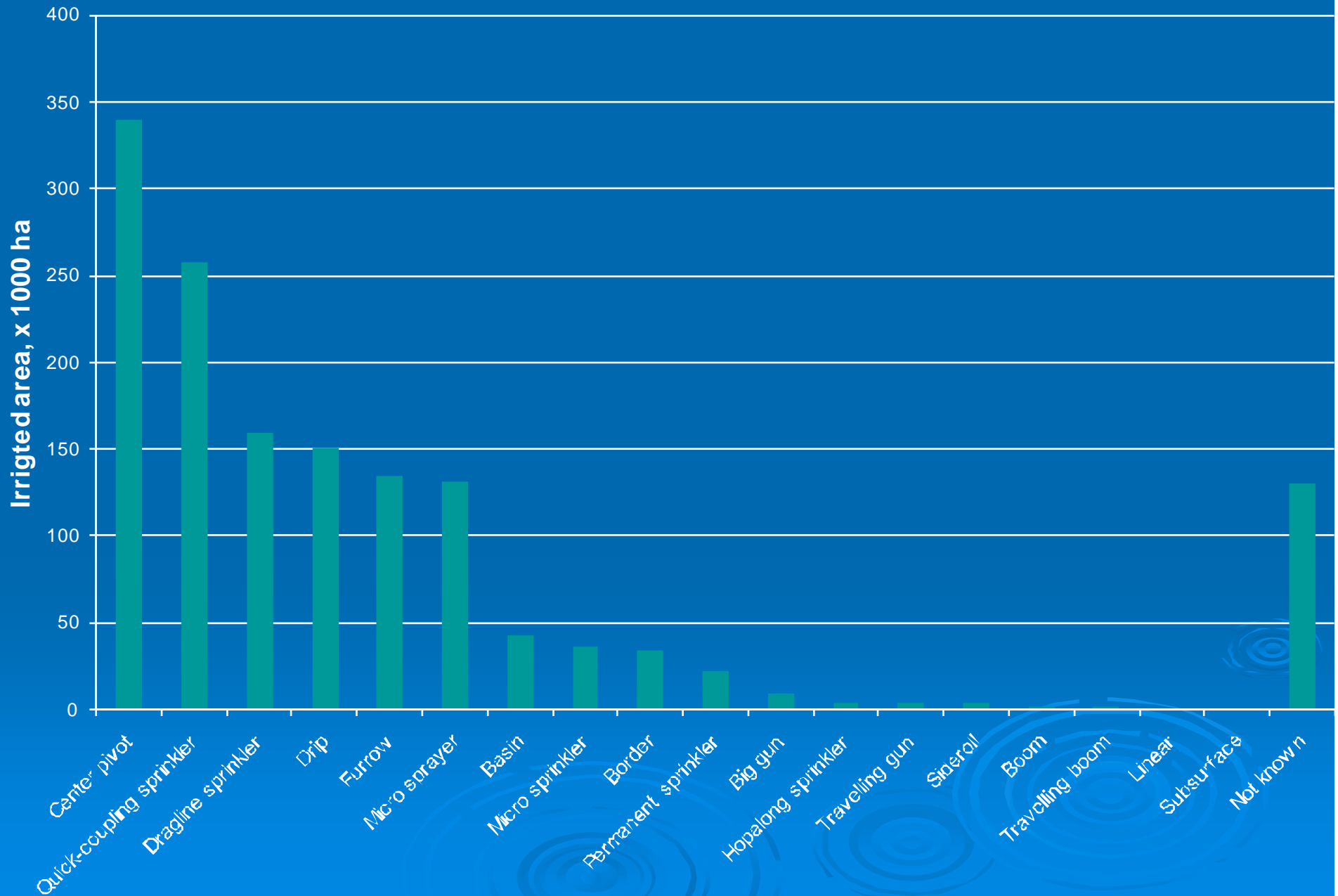


Per-capita cereal production by world region



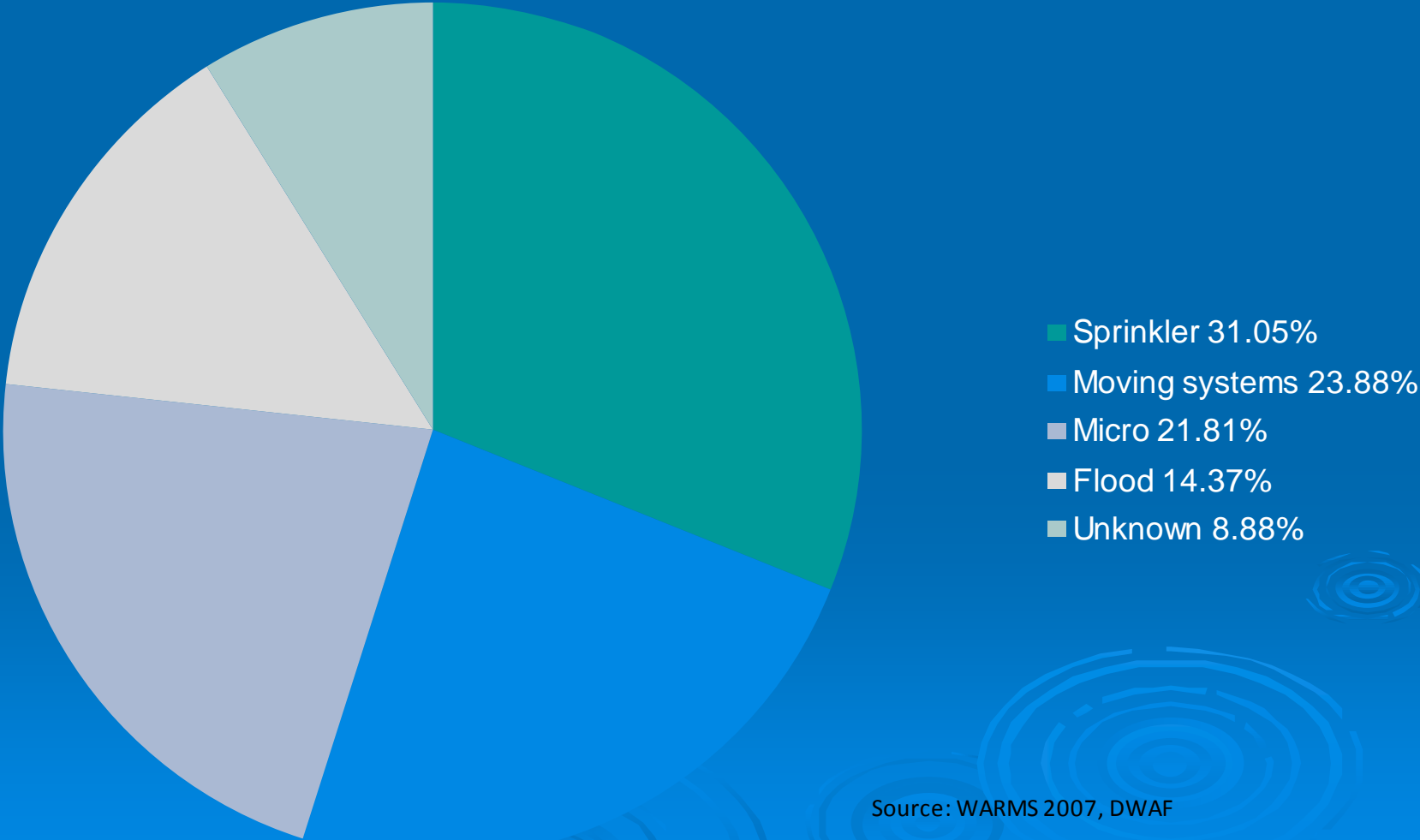


Irrigated area per irrigation system



Irrigation statistics in South Africa

Distribution of irrigation system types



Source: WARMS 2007, DWAF



Conclusion



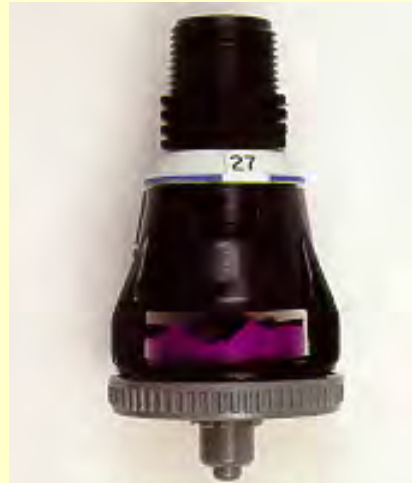
Wide Regulation Range







ROTATOR



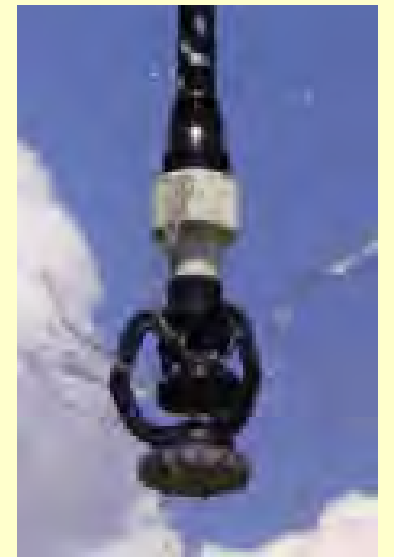
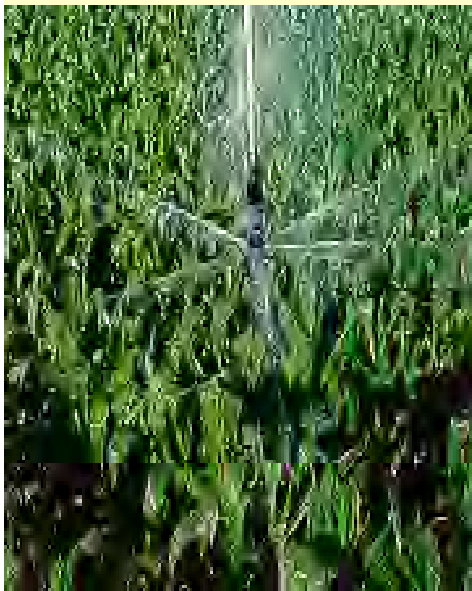
SPINNER



SPRAYHEAD

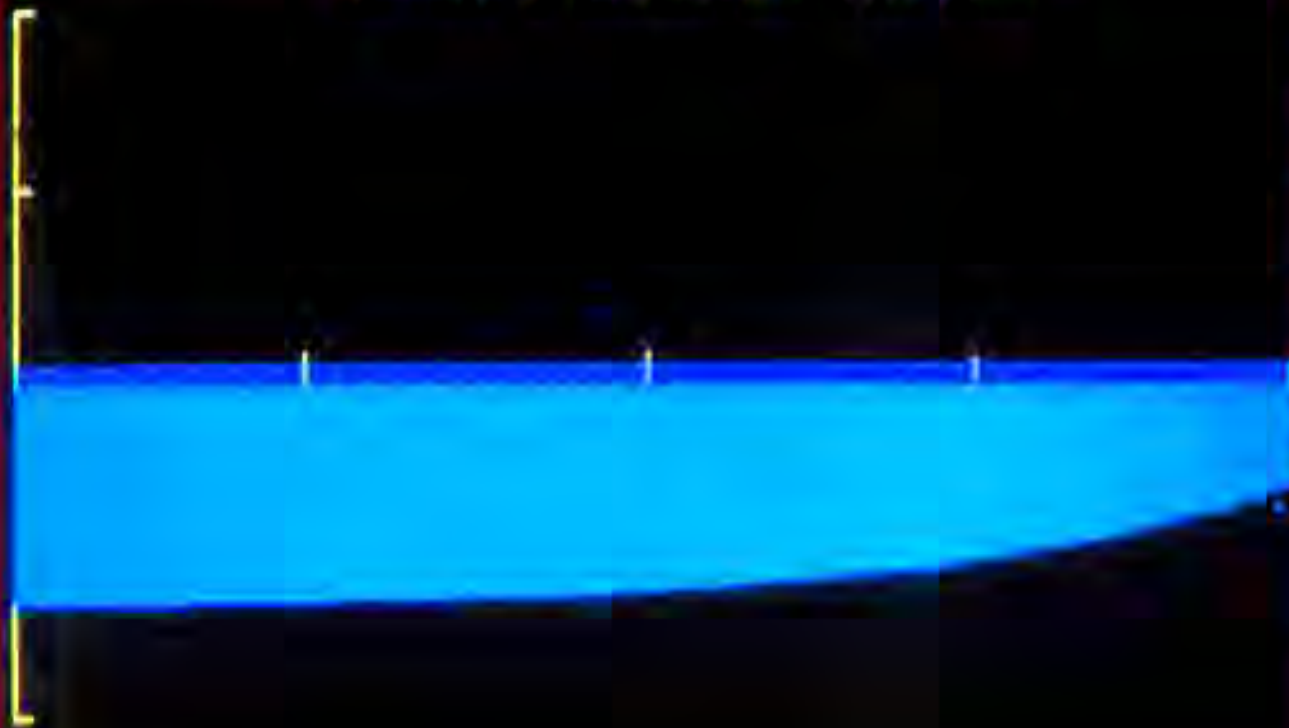


WOBLER





Surface & Subsurface Profiles



Elapsed
Time, min..... 149.0

Advance
Distance, m... 250.0

Advance
Time, min..... 99.1

Vol. Balance, m=3

Total Inflow..15.59999

Total Infilt..14.83694

Total Runoff.. 0.68719

Total Error... 0.07586

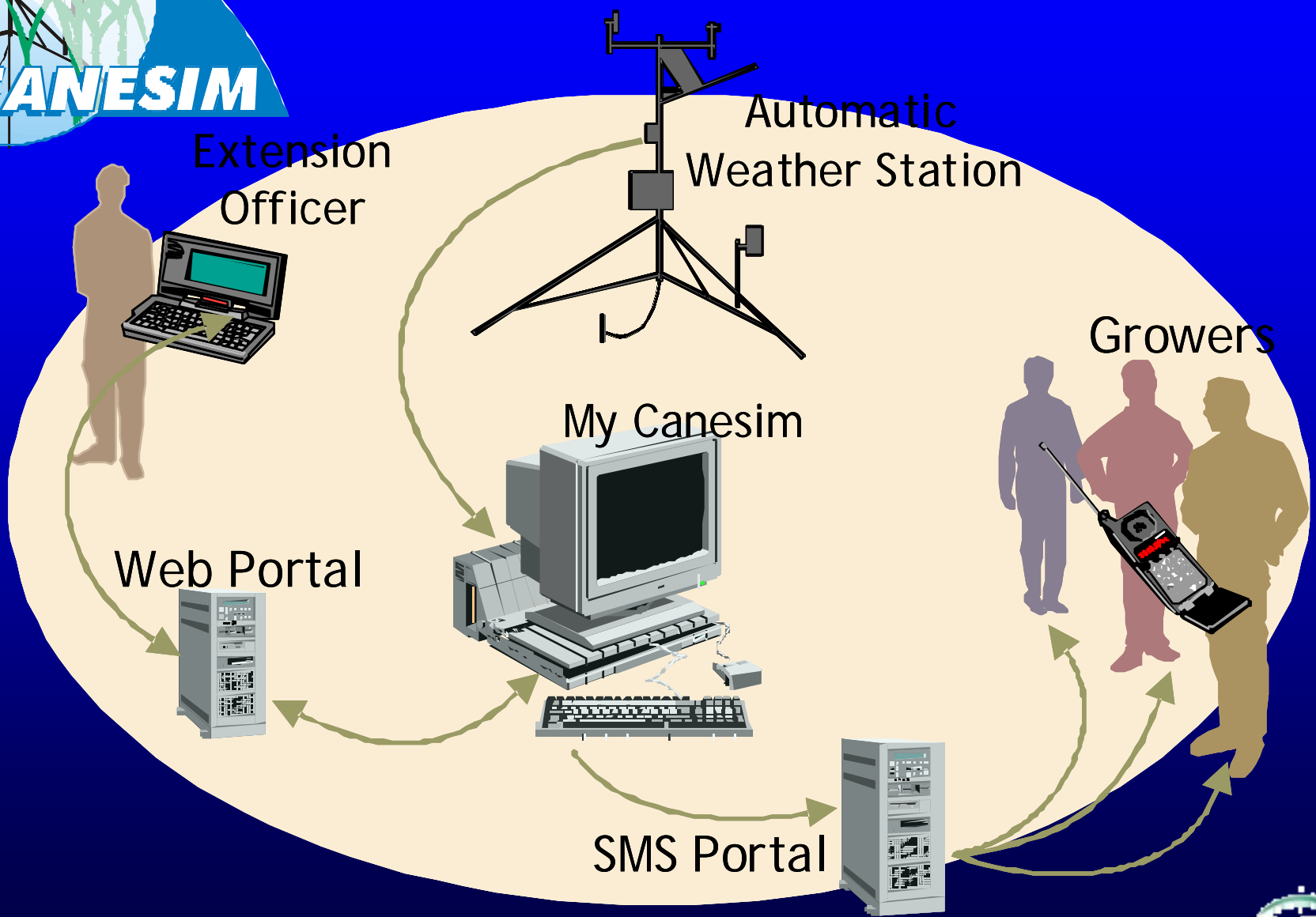
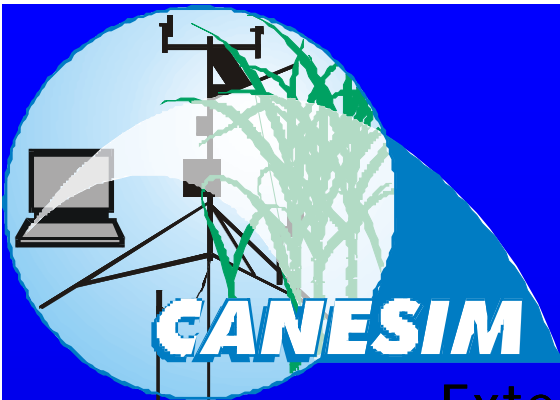
Run has ended. Press
END for the MAIN MENU

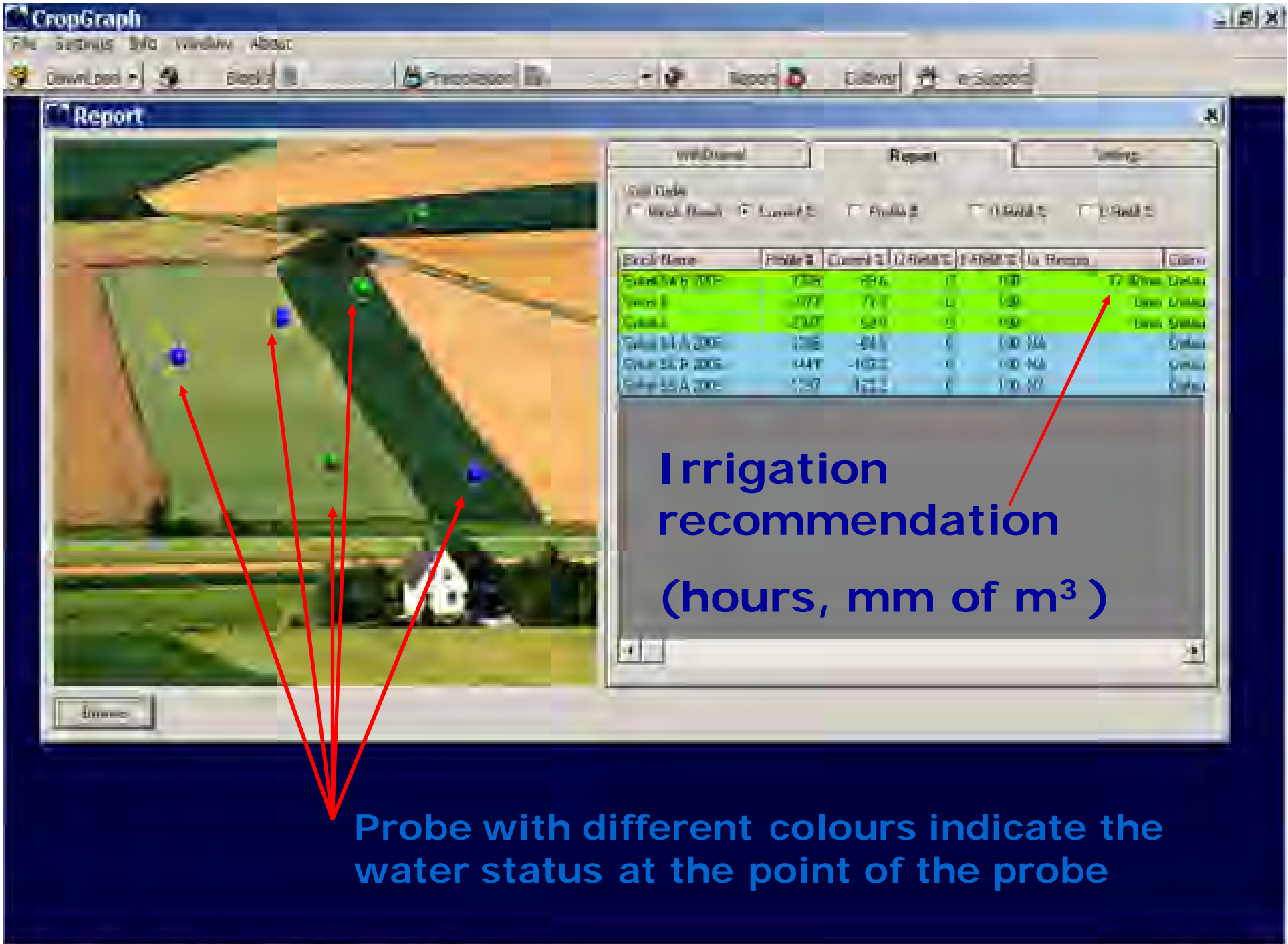
Runoff Hydrograph



Water Administration System

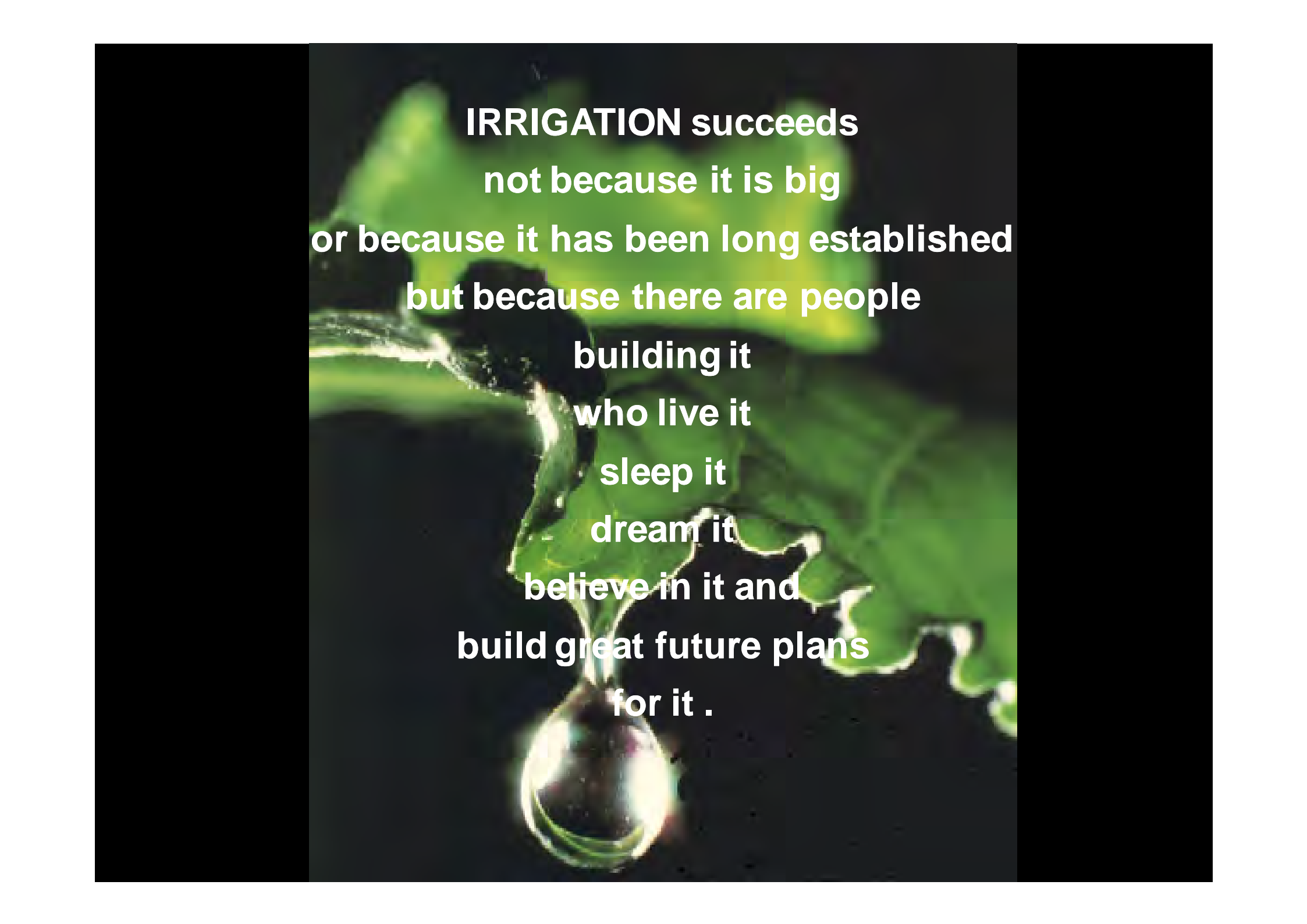












**IRRIGATION succeeds
not because it is big
or because it has been long established
but because there are people
building it
who live it
sleep it
dream it
believe in it and
build great future plans
for it .**