

بسم الله الرحمن الرحيم

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SESAME

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

SESAME

Sesamum indicum L

Introduction

Sesame is a grass plant known by name of sesame or Glgan and other Arab names registered like Selait, Sherag.

Sesame is considered as one of the important oil seed crops besides being a food for human being whether directly as seed or oil as a main material for many food industries like different sweet industries besides .it use in eating ,medicine, soup industry and cleaning ,washing oils, cooling creams. Fodder from sesame used as food for animals. There is an increase in international and external consumption and more attention was given to develop and increase production. Sesame is cultivated mainly in India, China and in Africa specially Sudan and Latin America and South Saudi Arabia and Yemen.

Benefit of Sesame

Benefit for heart: Sesame oil can help body in removing the recent growing cholesterol because it activates the movement of blood in arteries.

Anti – Cancer: it is discovered that sesame oil is blocking growth of unpleasant cancer.

Food and Digestion: sesame is used in many medical uses and it is well known as laxative to the digestive system.

Other benefits: it is beneficial to many other diseases like headache, dizziness, unclear seeing, sleeplessness and in hemorrhoids cases.

Components of sesame oil

- 1- High and unique protein content.
- 2- Very high quantity of Etholeen which is important for good health of liver and kidney.
- 3- Contains amino- fat.
- 4- Vitamin (E) and fats that activate blood circulation in body.
- 5- Calcium, phosphate, potassium, iron.
- 6- Does not contain cholesterol.

Nutritional Information - 100% Pure Fragrance Sesame Oil

Contents	Per 100g
Energy	900kcal*
Protein	0g
Total fat	100g
-saturated fat	14.2g
Cholesterol	0mg
Carbohydrate	0g
Dietary fibre	0g
Sodium	16mg

*1 kcal = 4.2kg

Types of sesame

Traditional types: in traditional sector the following types are cultivated :

- Hareery (early ripe)
- Gabrook (medium ripe)
- Traditional and Gabaly (late ripe)

Improved types: these types are approved by agricultural research corporation and cultivated in very limited area.

- Cultivation 1, 3, 6, 7 types of white seeds
- Horiya 39 – of brown seed
- Kenana – k3
- Promo k
- Types of early ripe like kenana 2

Areas of cultivating

It is cultivated by rain in North Kordofan (Um Ruwaba and Shaikan province) it is cultivated by irrigation in Gadaref, Dmazeen and in small areas in North Darfor and Rank and Southern provinces.

Time of cultivation in Sudan

Results of different researches confirmed that the ideal time in general in the muddy lands of mechanical cultivation after rain fall of 100 m.m or enough quantity of rain to close gabs in land. This takes place in the beginning of July or mid June in the southern area of cultivation or the northern area after 15 days. Early cultivation means cultivation first then removal of grasses after growth of the crop i.e. cultivation without plowing and this means more cost in removing grass but it is compensated by increase in production. While on the other hand delay in cultivation means that small plants will be faced by heavy rain during August leading to death of many plants. Moreover late cultivation means that crops will be target to insect and thirst at the end of the season besides plowing wet land will hinder preparing good bed for seeds.

Method of cultivation in Sudan

Sesame is cultivated mechanically by machines in mechanical cultivation and by hand in the rainy cultivation. Cultivation must be in lines and selection of the suitable types for mechanical harvest and must be homogeneous in growth and height.

Also cultivation by hand takes place in rainy traditional sector by mixing it with sand and are two fingers of the hand in throwing seeds. The recommended plant density is 90-100 thousand plant for feddan. The area between plants is 60 c.m. between lines and 7-10 c.m. between plants within the one line. To get the recommended plant density the quantity of seeds must be 1-5 k.gram for everu feddan by cultivation in row planter. The agricultural recommended round must be followed that is to cultivate half area sesame and the other half by other un grass crop or to be left without cultivation. Grasses must be struggled by the following:-

- 1- Use of chemical insecticides.
- 2- Mechanical cutting of grasses which needs cultivation in organized lines.
- 3- Plowing uncultivated areas before producing seeds.

The second cutting (kadeeb) after 3 weeks of age of plant and any delay will lead to decrease in production. The hand struggle gives more revenue although it is difficult compared to cost of harvesting.

The productivity of feddan ranges between 12-14 Quintal. One of the important insects attacking sesame is the Raooma (Alkaook) which sucks contents of seed and changes its taste and decreases percentage of fats in it.

Fertilizing

Response of sesame to nitrogen fertilizing is very weak and may not exceed 5%. In case of completing irrigation of sesame, response fertilizers may reach 40% with different types of sesame and this confirms the importance availability of moisture.

Harvesting

Mechanical:-

this type needs that cultivation is in lines and spray plants with some light chemicals to guarantee homogenous dryness and ripe of plants besides presence of types suitable to mechanical harvest homogenous in ripe with its leaves fall completely when harvesting and resisting to sleep or hard and without leaves.

Hand harvest:-

Cutting of sticks when showing signs of ripe which is the yellow color of parts of the plant and fall of most leaves and crack in some of the lower product. The crop is cut and wrapped up in small bundles and placed in a vertical position like wheat to avoid scattering of seeds for period of one to 2weeks according to heat temperature. The product then get dry and open and then bundles are turned and shaken on oil cloth or pieces of jute and cleaned by sifting and scattering.

Economics of sesame

Sesame exports play an important role in the national economy. Sesame besides its role in achieving food security for human beings and animal food besides provision of raw material for some industries especially food oil, it stands on top of Sudanese exports. Sudan is considered as one of the important and biggest producing countries.

In the following pages we will explain cultivated areas, productivity, production, exports and imports and prices of sesame.

World cultivated area of sesame

The average world cultivated area is about 7.4 million hectare. India comes at top in terms of cultivation area with about 1.75 million hectare (23% of total world area). Sudan comes second with 1.43 million hectare (19% of total world area). Myanmar comes third with 1.37 million hectare (18% of total area). China comes fourth with 0.5 million hectare (6.8% of total area). Uganda and Nigeria (0.3 million hectare) (4% of total area) and Ethiopia (0.2 million hectare) (2.7% of total area).

Table (1) shows the cultivated areas for the period 2005- 2009. From this table we notice that cultivated area in Sudan increased in 2006 by 19% than 2005 and decreased of 38% in 2007 then increased in 2008 by 34% and decreased of 17% in 2009 than 2008.

Also we can notice that Ethiopia expanded the cultivation of sesame markedly in 2009 by 70%. Ranked sixth among the world countries in terms of area.

Table (1): cultivated areas during The Period 2005-2009

Countries	Areas by Hectar					
	2005	2006	2007	2008	2009	Average
China	594228	569720	486580	472460	476909	519979.4
Ethiopia	205153	219681	211311	185912	315843	227580
India	1723200	1647000	1830000	1700000	1870000	1754040
Myanmar	1337900	1187000	1367000	1431000	1570000	1378580
Nigeria	196000	197000	299280	317080	300000	261872
Sudan	1523340	1807920	1113330	1489080	1234170	1433568
Uganda	268000	276000	280000	286000	292000	280400
United Republic of Tanzania	135000	120000	120000	120000	120000	123000
Other countries	1547645	1355891	1345352	1405225	1521354	7414113
World	7530466	7380212	7052853	7406757	7700276	7414113

source : Food Agriculture Organization (FAO)

World productivity of sesame

Table (2) shows the productivity of sesame in different countries. From this table we notice that some countries like India although has big in cultivated

area but with average production of hectar 3700 hecto gram (hecto gram = 100 gram). Sudan average productivity for hectar is 2200 hecto gram. Myanmar 5700 H.G while china registered 12000 H.G. Saudi Arabia 17000 H.G while the highest country is Lebanon registering 32000 H.G for 2009.

Table (2): productivity of hectar during The Period 2005-2009

Countries	productivity (HG/HA)					
	2005	2006	2007	2008	2009	Average
China	10532	11629	11458	12411	13061	11818
Ethiopia	7256	7277	7069	10046	8248	7979
India	3720	3752	4136	3764	3513	3777
Myanmar	3765	5812	5709	5963	5525	5355
Nigeria	5102	5076	3932	3835	3666	4322
Sudan	1818	2212	2173	2350	2576	2226
Uganda	6007	6014	6000	6048	6095	6033
United Republic of Tanzania	4074	4000	4000	4000	4000	4015
World average	4555	4977	5169	5167	5164	5006

Source: Food Agriculture Organization (FAO)

World production of sesame

The world average yearly production is nearly 4 million metric tons. Myanmar comes on top of countries producing sesame although some other countries possess more cultivated areas like India and Sudan.

The share of Myanmar on the world production about 20%, Indies share about 18% and contribution of China in world production for the years 2005-2009 about 16.5%.

Sudan comes the fourth in production and its contribution in world production for the years 2005-2009 recorded 8%, 11%, 7%, 9% and 8%.

We notice that production increased in 2006 by 44.4% compared to 2005 but in 2007 it decreased by 39.5%. In 2008 production improved so much with increase of 44.6% compared to 2007 then decreased in 2009 by 9%.

Table (3): production during The Period 2005-2009

Countries	production by metric ton					
	2005	2006	2007	2008	2009	Average
China	625844	662571	557537	586408	622905	611053
Ethiopia	148861	159881	149388	186772	260534	181087
India	641100	618000	756900	640000	657000	662600
Myanmar	503790	689900	780520	853390	867520	739024
Nigeria	100000	100000	117700	121610	110000	109862
Sudan	277000	400000	242000	350000	318000	317400
Uganda	161000	166000	168000	173000	178000	169200
United Republic of Tanzania	55000	48000	48000	48000	48000	49400
Other countries	918134	829167	825921	867932	915009	871233
World	3430729	3673519	3645966	3827112	3976968	3710859

source : Food Agriculture Organization (FAO)

Word imports of sesame

The average world imports during the period 2006-2010 were about 1 million tons with average value of 1340 million dollars. China comes on top of importing countries with average import of 275000 ton per year. Ethiopia, India, Sudan, Myanmar and Tanzania are the important exporting sesame countries to China and it shared in world imports in 2010 by 37%. Contribution of Sudan in imports of China is about 6.3% in 2009 and the increase in demand by china led to expansion in world market and this is considered as a chance for Sudan to increase its export to China.

Japan comes second in list of importing sesame with average of about 161000 tons and share in worlds imports about 17%, also we find EU-27 is one of biggest importers of sesame, registering 106000 tons in the average 2006-2010 (share in worlds imports is 13%). India, Sudan, Ethiopia, Guatemala and Paraguay are considered the important market exporting to EU-27.. For America the average of its imports registered 39000 tons and the main exporters India, Guatemala, Mexico, Venezuela and El Salvador.

On the Arabic countries level Saudi Arabia, Egypt, Syria, Lebanon, Jordan are considered the biggest importing markets and market share of Sudan in those market in 2009 about 97.4%, 49.2%, 50.2%, 35.4%, 11.9%.

The following table 4 shows imports of sesame for the period 2006-2010. Quantity in thousand tons and value in thousand dollars.

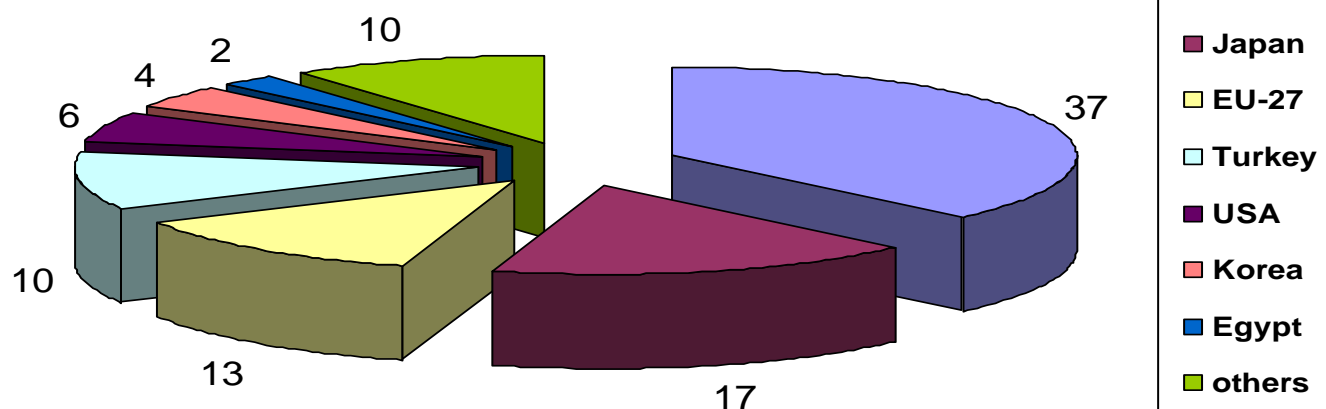
Table(4):Top importers of sesame during The Period 2006- 2010

Countries	2006		2007		2008		2009		2010	
	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$
Japan	159.1	148,415	169.6	170,842	185.1	374,097	128.9	180,990	161.4	231,378
China	263.6	210,873	194.5	168,883	214.2	249,375	311.3	387,610	390.7	503,960
USA	43.3	54,208	40.5	54,706	37.9	89,643	36.0	73,895	37.0	74,659
Korea	85.6	83,143	59.7	68,412	63.9	117,522	73.0	112,033	31,5	55,328
Turkey	95.1	68,745	107.6	92,263	80.2	122,651	92.0	128,433	102.1	141,870
EU-27	101.3	106,675	108.4	126,690	109.5	220,021	106.5	178,822	106.0	174,569
Egypt	12.8	12,272	8.6	8,726	24.1	47,351	18.6	32,027	21.9	32,475
Others	283.7	279849	306.7	322090	322.9	571418	264.2	431521	138.8	138340
World	1044.5	964,180	995.6	1,012,612	1037.8	1,792,078	1030.5	1,525,331	957.9	1,352,579

Table (5): Trade Indicators of top countries importing sesame seeds

Importers	Trade Indicators							
	Value imported in 2010, in 1000\$	Quantity imported in 2010, in 1000 ton	Unit value (USD/TON)	Annual growth in value between 2006-2010 %	Annual growth in quantity between 2006-2010 %	Annual growth in value between 2009-2010 %	Annual growth in quantity between 2009-2010 %	Share in world imports %
World	1,352,579	957.9	1412	40	-8	-11	-7	100
China	503,960	390.7	1290	139	48	30	26	37
Japan	231,378	161.4	1434	56	1	28	25	17
EU-27	174,569	106.0	1647	64	5	-2	-0.5	13
Turkey	141,870	102.1	1390	106	7	10	11	10
USA	74,659	37.0	2018	38	-15	1	3	6
Korea	55,328	31,5	1756	-33	-63	-51	-57	4
Egypt	32,475	21.9	1483	165	71	1	18	2

Share in worlds imports



World exports of sesame

The average world exports for the last five year was about 0.98 million tons with average value of 1247 million dollars and average price of about 1272 dollars for ton. From the following table (6) exports of sesame for 2006-2010 we notice the continued increase in exported quantities of sesame during the period. India, Ethiopia, Sudan, Nigeria, Paraguay, China, and Guatemala are considered the biggest exporting countries, the average exports of them are 223, 189, 158, 126.4, and 42.2, 39.3 thousand tons with share in world's exports about 23%, 19%, 16%, 13%, 4% and 4% respectively. We notice also that the important world markets for India are USA, Korea, Netherlands, Turkey, and China. And partners of Ethiopia are China, Israel, Turkey, Jordan and Saudi Arabia.

Sudan comes on top of exporting countries in years 2000, 2002, 2004.

Egypt, Saudi Arabia, Korea, Japan, Syria, and Lebanon considered the important world markets for Sudanese sesame. China world markets are limited to Japan, Korea, Hong Kong, Australia, and Singapore. The main world markets of Nigeria are Japan, Netherlands, U.K., France, and Belgium. The important world markets for Myanmar markets are Singapore, Japan, China, and Australia.

In 2010 Nigeria comes on top of exporting countries the annual growth in quantity between 2009-2010 is 109% and growth in value is 228 and Sudan's

growth in quantity by 63% also growth in value by 17% this growth has contributed to world growth in quantity by 5% and in value by 10%. The following table (6) shows the exports of sesame in quantities in thousand tons and value in thousand dollars.

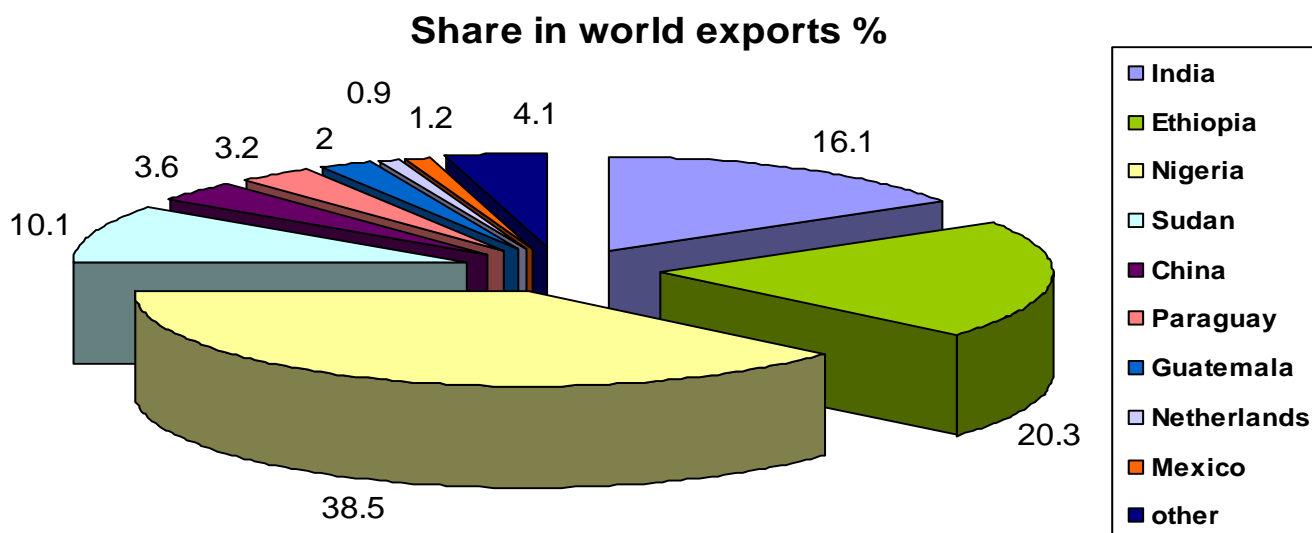
Table (6): Top exporters of sesame during The Period 2006- 2010

Source: UN comtrade, Bank of Sudan

Countries	2006		2007		2008		2009		2010	
	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$	quantity 1000 ton	Value 1000\$
India	203.5	171,302	302.3	319,406	255.3	434,769	177.3	253,727	176.6	266,429
Ethiopia	189.5	160,619	139.7	133,029	131	209,929	255.8	334,484	228	335,888
Nigeria	12	2,623	147	118,244	130	151,300	111	194,395	232	637,931
Sudan	219	167,039	111.8	92,787	96.7	141,846	137.7	143,352	224.1	167,264
China	45.3	55,916	41.5	56,822	42.5	82,776	34	60,253	33	59,871
Paraguay	28.8	28,363	45	40,041	40.3	100,448	60.7	75,934	36	52,601
Guatemala	14.7	16,207	26.7	26,781	13.3	22,861	19.1	32,391	23.1	33,761
Netherlands	14.4	19,080	13.9	21,356	15	35,107	17.2	30,430	7.9	14,473
Mexico	10	15,696	8	13,424	9	24,674	7	17,361	9	19,450
Others	126.5	105469	41.1	50584	181.9	251442	273.3	364791	172.7	68118
World	863.7	742,314	877	872,474	915	1,455,152	1,093.1	1,507,118	1142.4	1,655,786

Table (7): Trade Indicators of top countries exporting sesame seeds

Exporters	Trade Indicators							
	Value exported in 2010, in 1000\$	Quantity exported in 2010, in 1000 ton	Unit value (USD/TON)	Annual growth in value between 2006-2010 %	Annual growth in quantity between 2006-2010 %	Annual growth in value between 2009-2010 %	Annual growth in quantity between 2009-2010 %	Share in world exports %
World	1,655,786	1142.4	1449	123	32	10	5	100
India	266,429	176.6	1509	56	-13	5	0	16.1
Ethiopia	335,888	228	1473	109	20	0	-11	20.3
Nigeria	637,931	232	2750	24221	1833	228	109	38.5
Sudan	167,264	224.1	746	0	2	17	63	10.1
China	59,871	33	1814	7	-27	-1	-3	3.6
Paraguay	52,601	36	1461	85	25	-31	-41	3.2
Guatemala	33,761	23.1	1462	108	57	4	21	2.0
Netherlands	14,473	7.9	1832	-24	-45	-52	-54	0.9
Mexico	19,450	9	2161	24	-10	12	29	1.2



Sudan exports of sesame seeds to the world

Sesame seed one of the important economic crops, and Sudan is considered one of the largest and most important in the production and export of sesame. Occupied the center stage of the exports of other commodities during the period 2000-2007. The below table showed Sesame seeds exports, annual growth and share in non oil export During the Period 2006-2010.

Sudan is famous for cultivating high-quality white sesame, red mixture and mountain black.

Sudan occupies second place after India in cultivated areas and ranked fourth in terms of world production during the period 2005-2009.

The most important importing countries from Sudan are: Japan, South Korea, America, Egypt, Turkey, China, Netherlands, Germany, Greece, Syria, Mexico, and Saudi Arabia.

Countries Competition: sesame produced in many countries of the world such as India - China - Ethiopia - Mexico - Pakistan - Uganda - Jordan - Syria - Somalia - Saudi Arabia - Iraq - Palestine – Yemen, but India is the largest competition for Sudan.

Table (8): Sesame seeds exports, annual growth and share in non oil export during the Period 2006-2010

years	Value exported in USD	Quantity exported	Non oil exports in USD	Annual growth in	Annual growth in	Share in non oil

	thousand	in Tons	thousand	value %	quantity %	exports %
2006	167,039	219,047	569,357	41	42	29.3
2007	92,787	111,798	460,722	-44.5	-49.0	20.1
2008	141,846	96,744	576,393	52.9	-13.5	24.6
2009	143,352	137,659	702,441	1.1	42.3	20.4
2010	167,264	224,137	1,709,085	16.7	62.8	9.8

Sudans Exports of sesame in Tons

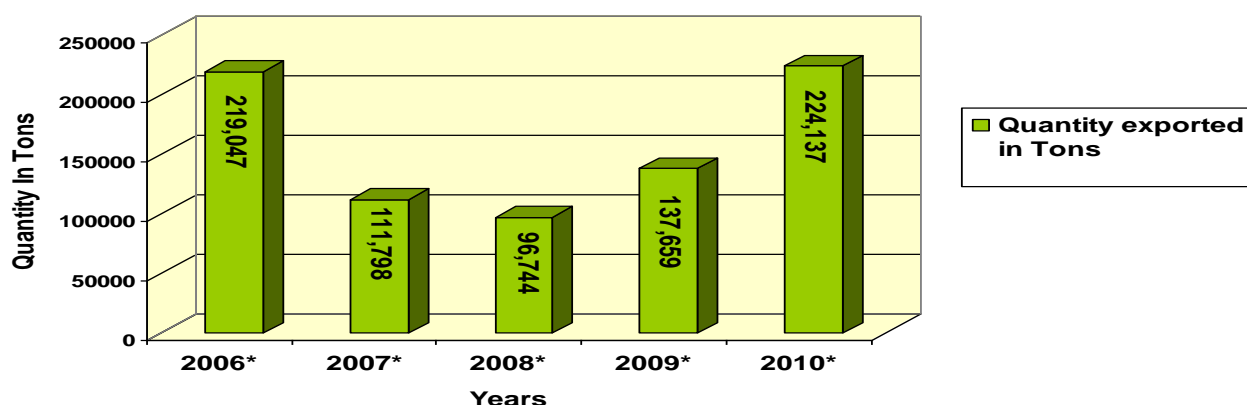


Table (9): Top importer of sesame seed from Sudan in 2009

Value: in USD thousand

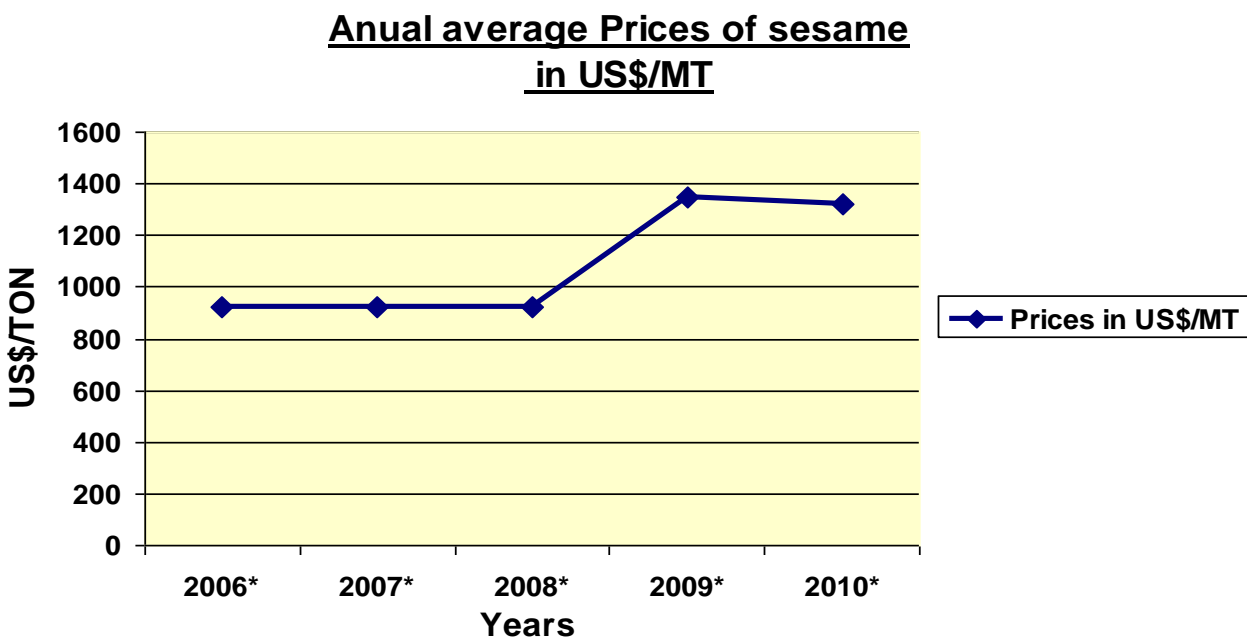
Partners	Sudan exports value	Partners imports from world	Market share %
World	143,352	1,525,331	9.4
Saudi Arabia	31261	32,098	97.4
China	24401	387,610	6.3
Egypt	15769	32,027	49.2
Syria	15119	30,089	50.2
Lebanon	10991	31,029	35.4
Tunisia	6802	15,074	45.1
Greece	3761	53,270	7.1
Korea	3454	112,033	3.1
Jordan	2990	25,039	11.9
UAE	2469	15,687	15.7
Turkey	1650	128,433	1.3
Japan	1238	180,990	0.7

Sudan's sesame prices

Table 10 shows average prices of Sudanese sesame exports. From this table we notice fluctuation of prices which declined in the period 2006-2010. There is price booming in 2009 by 46.6%. These high prices are a result of increased production costs and exports costs from

Table (10) average Sudan's sesame prices

natural CIF Europe (\$/mt)	
Year	US\$
2006	920
2007	920
2008	920
2009	1349
2010	1320



Cost of export of sesame(Gadaref)

* price of Quintal =	161.5	pound
Expenses of Quintal =	3.5	
Cost of Quintal for export	165.0	pound

Lost during cleaning (6%)=	175
Cost of metric ton= $175 \times 22.26 = 3895$	pound
Cost of transport to portsudan=	37.5
Port Sudan Expenses =	38.0
cost of ton (FOB) =	3970.5 pound
cost of ton in \$ (FOB) =	1470 \$
Bank commission (4 months) $3/100=$	41\$
Shipping =	45\$
price of ton in \$ (C&F) =	1556 \$

* Price of quintal tell March 2011

Conclusion

Although Sudan is on top of world countries exporting sesame there are some problems and obstacles facing export of Sudanese sesame.

Some of these problems are as follows:

- **Un availability of enough seeds of white sesame.**
- **Bitterness in some cultivated types of sesame.**
- **Problem of insects in general.**
- **Crack of cultivated types when get ripe results in complete loss of crop in casa of late harvest.**
- **Speculation in foreign market leads to deterioration of world price.**
- **Cost of production is high besides decrease in productivity.**

Solutions to encourage export:

- **Production of white sesame seeds from defects and not liable to crack.**
- **Production of types of sesame more resisting to diseases.**

- **Control of supply in foreign markets to stop speculations.**
- **Raise marketing efficiency by provision of information about world movement and prices of commodities.**
- **Taking case of trademarks and weights needed in foreign markets.**
- **Organization of markets inside the country besides control of prices locally.**

Sources of information

- 1- Ministry of Agriculture and Forests.
- 2- Bank of Sudan.
- 3- Fao.org
- 4- Un comtrade