POST HARVEST PROFILE OF GROUNDNUT

CONTENTS

1.0 INTRODUCTION

Groundnut botanically known as *Arachis hypogeae* belongs to Leguminosae family. India is the second largest producer of groundnut after China accounted for 21.03% share in the world production during 2003. It is the largest oilseed in India in terms of production. Groundnut accounted for 34.66 % of the production of oilseeds in the country during 2001-02. Gujarat is the largest producer contributing 25% of the total production followed by Tamil Nadu (22.48%), Andhra Pradesh (18.81%), Karnataka (12.64%), and Maharashtra (10.09%) during 2002-03. Groundnut contains on an average 40.1% fat, 25.3% protein and is fairly a rich source of calcium, iron and vitamin B complex like thiamine, riboflavin, niacin and vitamin A. It has multifarious usages. It is not only used as a major cooking medium for various food items but also utilized for manufacture of soap, cosmetics, shaving cream, lubricants, etc. In fact, it plays a pivotal role in oilseed economy of India.

Table No. 1: Nutritional value of edible portion of Groundnut per 100 gram.

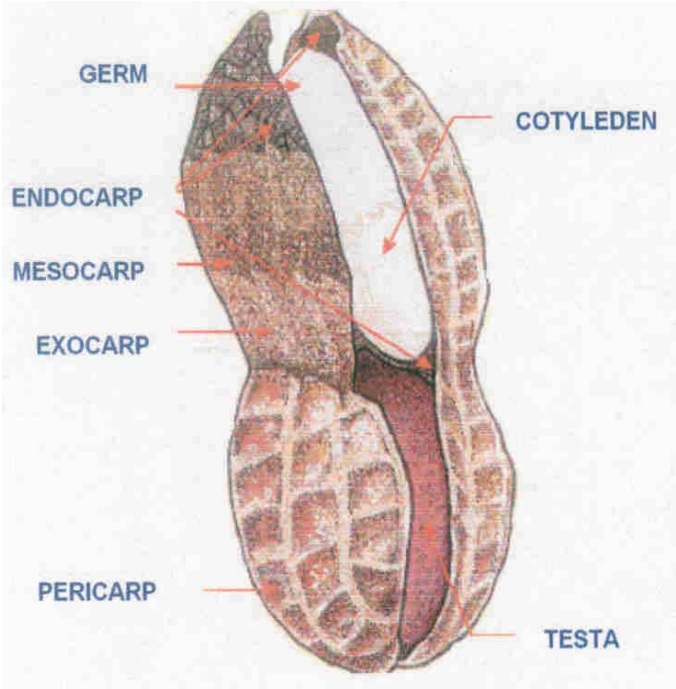
Type of Groundnut	Energy (cal.)	Protein (g)	Fat (g)	Ca (mg)	Fe (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Vit. A (mcg)
Groundnut	567	25.3	40.1	90	2.8	0.90	0.13	19.9	37
Roasted Groundnut	570	26.2	39.8	77	3.1	0.39	0.13	22.1	0

Source : Nutritive value of Indian Foods, by Gopalan, L., et al., Indian Council of Medical Research Publication, 1971, pp.60-114

Botanical Description:

Groundnut botanically belongs to *Arachis hypogaea* Linn. of Leguminosae family. Groundnut is a self-pollinated, annual, herbaceous legume crop. A complete seed of Groundnut is called as pod and contains one to five kernels, which develops underground in a needlelike structure called as peg. After the pollination, aerial pegs grow into the soil and then convert into a pod. Groundnut has taproot system, which has many nodules, present in root and lateral roots. These nodules contain *Rhizobium* bacteria, which are symbiotic in nature and fixes atmospheric nitrogen.

Outer layer of Groundnut is called shell. The shell constitutes about 25-35 percent of the pod. The seed accounts for the remaining portion (65-75 percent). The colour of the testa varies from red, brown, purple to white depending on the type and variety. The kernel and germ are normally white in colour.



Groundnut pod profile

There are four botanical types of groundnut namely Virginia runner, Virginia bunch, Valencia and Spanish bunch and they differs in their chemical composition and oil quality. Virginia bunch type seeds are richer in oil and chemical contents followed by Spanish bunch. Protein content is higher in Valencia, while soluble sugars are higher in Virginia runner seeds. Highest oleic acid has been observed in Valencia type. The ratio of oleic to linoleic acid is higher in runner type, with good oil keeping quality. The nutritional quality is higher in Valencia types. In general, it can be stated that Virginia runner types have better chemical composition with balanced oil quality.

1.1 Origin :

It has been reported that South America was the place, from where cultivation of Groundnut originated and spread in Brazil, Southern Bolivia and North-western Argentina. Groundnut was introduced by the Portuguese from Brazil to West Africa and then to South-western India in the 16th century.

1.2 Importance :

India is one of the largest producers of oilseeds in the world and occupy an important position in the Indian agricultural economy. It is estimated that nine oilseeds namely Groundnut, Rapeseed-Mustard, Soybean, Sunflower, Safflower, Sesame, Niger, Castor and Linseed accounted an area of 23.44 million hectares with the production of 25.14 million tonnes during the year 2003-2004. Groundnut is called as the 'king' of oilseeds. It is one of the most important food and cash crop of country. Being a valuable source of all the nutrients, it is a low priced commodity. Groundnut is also called as wonder nut and poor men's cashew nut. Almost every part of Groundnut has commercial value. Economically; Groundnut is a very valuable oil seed crop of India. Due to source of good quality edible oil, Groundnut oil is intensively used for cooking purposes both as refined oil and vegetable oil (*vanaspati ghee*). Groundnut is widely used for table purpose as a snack. Groundnut is consumed as fresh, roasted, dried, boiled and in so many reciepics. It is also used in the manufacturing of soaps, beauty creams, medical ointments and creams, paints, lubricants and many other industrial products. India exports Groundnut kernels, in shell, HPS Groundnut and oil cake. Groundnut haulms and leaves serve as a rich source of cattle feed and raw material for preparation of silage. Being a leguminous crop, groundnut also grow in crop rotation as it synthesize atmospheric nitrogen and adds about 100-120 kg of nitrogen in the field per hectare per season. It maintains the fertility of soil and helps in reducing soil erosion. Groundnut oil cake is used as animal and poultry feed as well as a organic fertilizer. Groundnut shell is used in manufacturing industrial products like card-board boxes etc. and also for fuel purpose.

2.0 PRODUCTION

2.1 Major producing countries in the world :

Groundnut is cultivated in more than 60 countries in the world. During 2003, Groundnut occupied an area of 26462.86 thousand hectares with the production of 35,658.43 thousand tonnes in the World. Groundnut is mainly produced in Asian countries. China is the largest producer of Groundnut accounting for 37.71 present of total world production followed by India (21.03 percent) during the year 2003. China and India, together, accounted for about 58.74 percent of world Groundnut production. Nigeria (7.57 percent), United States of America (5.27 percent), Indonesia (3.86 percent), and Sudan (3.37 percent) were the other major Groundnut producing countries during the same years. In case of Area, India ranked first one with 30.23 percent in the World, during 2003, followed by China (19.37 percent), Nigeria (10.58 percent), and Sudan (7.18 percent). However, in productivity, United States of America stood first with 3540 kg/ha followed by China (2624 kg/ha), Argentina (2018 kg/ha) and Indonesia (2016 kg/ha) during 2003. Area, Production and Average Yield or Major Groundnut producing countries during 2001 to 2003 were as under.

Table No. 2: Area, production and average yield of Groundnut in the major producing countries.

Name of Country	Area ('000 Ha)				Production ('000 tonnes)				Yield (Kg/Ha)		
	2001	2002	2003	% to world	2001	2002	2003	% to world	2001	2002	2003
Argentina	251.06	222.37	156.40	0.59	564.00	517.00	315.60	0.89	2247	2325	2018
Burkina Faso	330.90	342.64	331.00	1.25	301.09	323.64	301.00	0.84	910	945	909
Chad	477.13	480.00	480.00	1.81	448.09	450.00	450.00	1.26	939	938	938
China	5016.42	4946.10	5125.40	19.37	14471.84	14895.10	13447.46	37.71	2885	3012	2624
Congo, Dem	473.64	456.59	456.59	1.73	368.45	355.18	355.18	1.00	778	778	778
Ghana	254.00	384.00	350.00	1.32	258.00	520.00	450.00	1.26	1016	1354	1286
India	6238.10	5953.50	8000.00	30.23	7027.50	4362.80	7500.00	21.03	1127	733	938
Indonesia	654.80	646.95	682.94	2.58	1245.00	1267.00	1377.00	3.86	1901	1958	2016
Myanmar	586.13	567.19	575.00	2.17	731.09	722.60	730.00	2.05	1247	1274	1270
Nigeria	2738.00	2782.00	2800.00	10.58	2683.00	2699.00	2700.00	7.57	980	970	964
Senegal	984.16	841.76	900.00	3.40	943.84	501.30	900.00	2.52	959	596	1000
Sudan	1531.32	1900.00	1900.00	7.18	990.00	1267.00	1200.00	3.37	647	667	632
USA	571.38	524.76	530.95	2.01	1939.88	1506.15	1879.75	5.27	3395	2870	3540
Viet Nam	244.60	246.70	240.30	0.91	363.10	400.40	400.10	1.12	1485	1623	1665
Otrhers	3689.68	3810.24	3934.28	14.87	3747.78	3515.93	3652.34	10.24	--	--	--
World	24041.32	24104.79	26462.86	100.0	36082.65	33303.10	35658.43	100.0	1500	1382	1348

Source : www.faostat.org

2.2 Major producing states in India :

Gujarat, Tamil Nadu, Andhra Pradesh, Karnataka and Maharashtra are the major Groundnut producing states. It has been observed that Gujarat was the largest Groundnut producer (25.0 percent) during 2002-03, followed by Tamil Nadu (22.48 percent), Andhra Pradesh (18.81 percent), Karnataka (12.61 percent) and Maharashtra (10.09 percent). In area, Gujarat ranked first with 34.12 percent of total area during 2002-03, followed by Andhra Pradesh (24.71 percent), Karnataka (14.12 percent), Tamil Nadu (9.24 percent) and Maharashtra (7.06 percent) whereas in productivity, among major producing States, Tamil Nadu stood first with 1784 kg/ha during 2002-2003, followed by Maharashtra (1041 kg/ha) and Orissa (870 kg/ha). Area, Production and Average Yield of major Groundnut producing states during 2001-02 and 2002-03 are presents in Table No. 3.

Table No. 3: Area, production and average yield of Groundnut in the major producing states during 2000-01 to 2002-03.

	Area (Million hectares)				Production (Million tonnes)				Yield (Kg./Ha.)		
Name of State	2000-01	2001-02	2002-03	%	2000-01	2001-02	2002-03	%	2000-01	2001-02	2002-03
1.Gujarat	1.75	1.89	2.03	34.12	0.69	2.65	1.09	25.00	395	1402	539
2.Tamil Nadu	0.70	0.66	0.55	9.24	1.36	1.25	0.98	22.48	1942	1885	1784
3.Andhra Pradesh	1.87	1.69	1.47	24.71	2.14	1.25	0.82	18.81	1144	739	558
4.Karnataka	1.06	0.85	0.84	14.12	1.08	0.59	0.55	12.61	1017	685	648
5.Maharashtra	0.49	0.43	0.42	7.06	0.47	0.49	0.44	10.09	959	1146	1041
6.Rajasthan	0.20	0.24	0.24	4.03	0.18	0.30	0.17	3.90	924	1227	687
7.Madhya Pradesh	0.21	0.22	0.19	3.19	0.23	0.24	0.12	2.75	1059	1121	635
8.Uttar Pradesh	0.12	0.11	0.07	1.18	0.10	0.09	0.05	1.15	835	839	662
9.Orissa	0.07	0.06	0.06	1.04	0.06	0.06	0.05	1.15	794	985	870
10.Others	0.09	0.09	0.08	1.31	0.11	0.11	0.09	2.06	-	-	-
All India	**6.56**	**6.24**	**5.95**	**100.00**	**6.41**	**7.03**	**4.36**	**100.00**	**977**	**1127**	**733**

Source : www.agricoop.nic.in

2.3 Zone-wise major commercial varieties :

Zone	State	Varieties
1.Northern Zone	Punjab Haryana Uttar Pradesh	M-13, M-37, M-145, MA-10, T-64, T-99, TE-1, ICCV-86564, Punjab-1, C-501, T-28, M-197, PC-1, ICCS-1, ICCS-5, DRC-17, M-1, M-2, Chitra Amber, Amber mikta
2.Western Zone	Gujarat Rajasthan	ICCS-44, CC-11, CAUC-10, ICCS-37, RSB-87, Punjab-1, CC-20, Somnath, M-13, RS-1, CC-7, BAU-13, CC-5, SB-11, TC-10, ICCS-479, ICCS-86564, TAC-24
3.Central Zone	Maharashtra Madhya Pradesh	Phale-Pragati, Copergoan-1, Faizapur-5, Prakash, Koynavikram, TAG-24, J(E)3, AK-12, AK-24, TG-17, ICGS-37, M-13, SG-84, HNG-10, AK-22, ICGS-11, TE-1, TAG-24, Jyoti
4.Eastern Zone	Orissa, Bihar West Bengal	BG-1, BG-2, B-30, M-13, B-31, BAU-13, BG-3, BP-1, BP-2, Birsa Bold, GG-2, Kisan, Jawan
5.Southern Zone	Andhra Pradesh Tamil Nadu Karnataka	ICGS-11, TMV-2, S-206, Pondicherry-8, JL-24, TMV-1, TMV-4, Kadiri-2, Kadiri-3, TMV-10, IEGV-87160, ICGV-86143, TMV-6, DRE-1, ICGV-86564, DH-8, DH-3-30, K134, VRI-2, HG-10, TMV-8, TMV-9, TMV-12, TMV-12, KRG-1, CO-3, CP-4

Bhabha Atomic Research Centre (BARC) has developed certain varieties with the help of genetic improvement by mutation. These are;

BARC Groundnut varieties released and notified for commercial cultivation

Name	Maturity (M) Yield (Y)	Released for states	Characteristics
TG-1	M: 130-135 days Y: 2400-2500 kg/ha	Maharashtra, Gujarat	Large seed
TG-17	M: 115-120 days Y: 1700-2000 kg/ha	Maharashtra	Less branches
TG-3	M: 110 days Y: 2000-2500 kg/ha	Kerala	More branches
TGS-1	M: 110-125 days Y: Kharif 2000 kg/ha	Gujarat	Large seed, Spreading habit
TAG-24	M: Kharif:100-105 days Summer:112-117 days Y: Kharif: 1300 kg/ha Summer: 2500 kg/ha	Maharashtra Karnataka West Bengal	Semi dwarf, Early maturity, High harvest index, High partitioning efficiency, High water use efficiency
TG-22	M: Kharif:115-120days Y: Kharif:1677 kg/ha	Bihar	Medium-large seed, Fresh seed dormancy
TKG-19A	M: 120-125 days Y: Summer 2000-2500 kg/ha	Maharashtra	Large seed, Fresh seed dormancy
TG-26	M: 110-120 days Y: Summer 2500 kg/ha	Gujarat, Maharashtra, Madhya Pradesh	Semi dwarf, Early maturity, High harvest index, High partitioning efficiency, Fresh seed dormancy
TPG-41*	M: 120 days Y: Summer 2407 kg/ha	All India	Large seeded (65g/100 kernel), O/L ratio 3.2

*Identified for release by ICAR Varietal Identification Committee

Source: www.barc.ernet.in

Varieties released by the National Research Centre for Groundnut at Junagarh (Gujarat)

Type of Varieties	Name of Variety
Large seeded varieties with reduced aflatoxin risk for export promotion	BAU 13, B 95, Somnath TKG 19 A and GG 20
Disease resistant varieties for endemic areas	
Multiple foliar disease resistant for rain-fed kharif	ALR 1, ALR 2, Girnar 1, ICG (FDRS) 10, ALR 3, ICGV 86590
Field tolerance to PBND under rabi/summer situation.	ICGS 11 (ICGV 87123), ICGS 44
Resistant to rust	ICG FDRS 10, ICGV 86590, R 8808, R 9201
Nematode tolerance (kalahasti melody)	Tirupati 2, Tirupati 4
Pests resistance	Girnar 1 (Jassid), ICGV 87160 (Aphid), Kadiri 3, BG 2 (Spodoptera)
Varieties for regional and multi-regional importance	
High yielding and early maturing spanish bunch varieties	DRG 17, K 134, DRG 12, Dh 86, JL 220, SR 1, VRI 2, VRI 3, VRI 4, Co 4, AK 159, GG7
High yielding and early maturing virginia varieties	CSMG 884, CSMG 84-1, HNG 10, LGN 2, JSP 21
High harvest index (about 50 percent)	TAG 24, TG 26,GG 2
Fresh seed dormancy	TG 17 (30 days), TG 26 (12-15 days), VRI 1(7 days), BSR 1 (21 days), Dh 40 (30 days)
Tolerant to acidic soils	TG 3, TG 22
Tolerant to salt affected soils	TG 32, K 1224, RHRG 104
Confectionery types	BAU 13, B 95, TKG 19A, GG 20,Somnath
High water use and partitioning efficient	TAG 24, TMV 2, ICG 2730, ICG 5263, NCAc 343, Somnath
Drought tolerant varieties	ICGS 37, CSMG 84-1, CSMG 8784,TAG 24, K 134
Paddy fallow residual moisture situations in Orissa and coastal Andhra Pradesh for rabi/summer season	RSHY 1, VRI 3, Dh 40, BSR 1
For rice based cropping systems in North-eastern States	BSR 1, TG 26, R 8806, Dh 40
For spring situations in Punjab and U.P.	ICGS 1, SG 84

Source: www.nrcg.guj.nic.in

3.0 POST-HARVEST MANAGEMENT

3.1 Post-harvest losses :

Post-harvest losses in Groundnut occur at different stages at harvesting, threshing, cleaning, winnowing, packaging, transportation, storages, processing and marketing. The losses during harvesting are due to left out pods in the soil. It has been estimated that post-harvest pod losses in harvesting varies from 16 to 47 percent, in curing / drying 5 to 50 percent. However in transportation, the losses occur on account of pilferage, leakage of gunny bags and rough handling. The losses during storage are mainly due to driage loss and through damage by rodents and pests. Damage also occurs due to dampness which develops the moulds, leading to contamination with Aflatoxin.

To minimise post harvest losses, the following measures should be followed;

1) Timely harvest when soil contains sufficient moisture.
2) Use of proper method of harvesting.
3) Collection of the left out pods from the soil.
4) Striping pods properly by adopting better mechanical methods.
5) Drying the wet pods immediately after harvest.
6) Avoiding dampness of stored pods to avoid mould formation.
7) Avoiding the losses in threshing and cleaning, to minimize damaged pods.
8) Adopting grading practices to get more profit.
9) Using good packaging in storage and transportation.
10) Using was proper scientific technique in storage for maintaining optimum moisture content of pods.
11) Using pest and rodent control measures before and after the storage.
12) Storing the Groundnut in the form of pods and avoid in the kernels forms.
13) Providing aeration to stored pods and stire bulk pods occasionally to avoid dampness and pest infestation.
14) Staking of the gunny bags on wooden planks to avoid dampness.
15) Properly handling at loading and unloading of Groundnut with efficient and hygienic transportation facilities to reduce the losses at farm and market level.

3.2 Harvesting care :

Harvesting of Groundnut comprises digging, lifting, windrowing and stacking of pods. Groundnut is harvested when plant foliage show yellowness. The pod is matured when it becomes hard and tough, and when there is dark tan discolouration inside the shell and the kernel become unwrinkled. Usually, the bunch varieties mature in about 100-105 days and the semi spreading and spreading varieties in about 125-135 days.

The following harvesting care should be taken;

1. Harvesting before maturity increases the free fatty-acid content in oil and with lesser shelling percentage, oil and protein content.
2. Immature Groundnut should not be harvested, as are more susceptible to fungal attack.
3. Delay in harvesting results in retention of more pods in soil and less yield.
4. Premature and delay in harvesting reduces viability of the seed kernel.
5. Harvest Groundnut in bright sunny day and avoid during humid/wet weather conditions.
6. Harvest Groundnut, when there is adequate moisture in the soil.
7. Protect the harvested Groundnut, from rain and excessive dew by covering.
8. Avoid heaping of harvested Groundnut to avoid mould formation, which leads in Aflatoxin contamination.
9. Stripped the pods from the plants after the harvest. If the stripping is delayed, spread the harvested plant for few days, which facilitates the drying of pods and air circulation.
10. Keep the harvested Groundnut separately for each variety, to get true to type variety i.e. kernel.
11. Dry the pods for 7-10 days, up to a safe moisture percent.
12. Usually the spreading and semi spreading varieties may be up rooted by harrowing, while bunch varieties may be up rooted by hand operation i.e. manually.
13. Harvesting should be done by adopting proper method harvesting.
14. Keep the proper moisture in the field of Groundnut during expected harvesting time.

3.3 Post-harvest equipments :

a) Harvesters :

1. Udaipur Animal Drawn Groundnut Digger	
Specification and Performance results	
Dimensions (lxwxh),m	1.75x0.30x0.57
Weight, kg	10
Power source	A pair of bullocks
Width of cut, mm	300
Operating speed, km/h	2.74
Field capacity, ha/h	0.16
Field efficiency, per cent	61
Total pod losses, percent	5.7
Digging efficiency percent	80-90
Labour requt., man-h/ha	6.70

b) Stripper

1. Groundnut Stripper (Drum Type)	
Specification and Performance results	
Dimensions (lxwxh),m	1.83x0.71x0.50
Weight, kg	28
Drum size, mm	280 dia x 610
Power source	One person
Output capacity, Kg/h	18
Stripping efficiency, per cent	100
Broken pod losses, percent	1
Total pod losses, percent	1
Labour requt., man-h/q	6

2. Groundnut Stripper (Comb Type)	
Specification and Performance results	
Dimensions (lxwxh),m	0.66x0.66x0.27
Weight, kg	14
Drum size, mm	280 dia x 610
Power source	1 to 4 person
Output capacity, Kg/h	40 (with 4 person)
Stripping efficiency, per cent	100
Broken pod losses, percent	Nil
Total pod losses, percent	Nil
Labour requt., man-h/q	12

c) Decorticator:

1. TNAU Groundnut Decorticator	
Specification and Performance results	
Dimensions (lxwxh),m	1.27x0.87x0.52
Size of oscillatior	520 mm arc length, 270 mm radius
Weight, kg	13
Power source	1 person
Shelling efficiency, percent	98
Shelling capacity, Kg/h	100 (graded pods)
Broken kernels, percent	1-2
Total kernels losses, percent	1-2
Labour requt., man-h/q	1

2. CIAE Groundnut cum Castor Decorticator	
Specification and Performance results	
Dimensions (lxwxh),m	0.51x0.25x1.11
Radius of oscillating beaters, mm	225
Weight, kg	15
Concave clearance, mm	10-25
Shoe size	210x50 mm, 3 Nos.
Concave openings, mm	45x9 for Groundnut
Power source	1 person
Shelling efficiency, percent	98
Shelling capacity, Kg/h	68 (graded pods)
Broken kernels, percent	2.30
Total decortication losses, percent	2.30
Labour requt., man-h/q	1,6

d) Pod Stripper:

Groundnut Pod Stripper	
Specification and Performance results	
Dimensions (lxwxh),m	1.4x1.0x0.6
Weight, kg	115
Cylinder size, mm	270 dia x 1250
Beater size	60 mm height, 120 Nos.
Type, of blower	Throwing type, One No.
Power source	2 hp electric motor
Cylinder speed, rev./min	330
Output capacity, Kg/h	120
Stripping efficiency, per cent	100
Cleaning efficiency, per cent	98 (total grain losses nil)
Power consumption, kW	1.2
Labour requt., man-h/q	3

e) Groundnut Thresher:

1. PAU Axial Flow Groundnut Thresher	
Specification and Performance results	
Dimensions (lxwxh),m	1.96x1.78x1.64
Weight, kg	550
Cylinder size, mm	530 dia x 1500
Beater size	12.5 dia x 75, (60 Nos.)
Type, of blower	Aspirator type, One No.
size of blower	400 mm dia x 1150 mm width
Power source	Tractor of 25 hp / above
Cylinder speed, rev./min	225-250
Output capacity, Kg/h	170 - 220
Broken grain, per cent	Less than 0.5
Total grain losses, per cent	1.0-2.25
Threshing efficiency, percent	99 – 99.5
Cleaning efficiency, per cent	92 - 98
Fual consumption, l/h	2.8
Labour requt., man-h/q	1.5

2. TNAU Groundnut Thresher	
Specification and Performance results	
Dimensions (lxwxh),m	2.05x1.65x1.57
Weight, kg	380
Cylinder tip dia, mm	410
Beater type	Curved edged pegs
Sieve	Oscillating type, 2 nos (top one With 50x17 mm, bottom one with 45x9 mm slots)
Type, of blower	Centrifugal, One no.
Power source	5 hp motor
Cylinder speed, m/s	7-10
Output capacity, Kg/h	146-168
Broken grain, per cent	1.5-2.1
Total grain losses, per cent	3.5-3.8
Threshing efficiency, percent	96 – 99.8
Cleaning efficiency, per cent	93 - 96
Labour requt., man-h/q	2

Source : Central Institute of Agricultural Engineering(CIAE), Bhopal.

3.4 Grading :

Grading is the process of sorting of a given product according to the stipulated grades or classes or grading means the sorting of the homogenous lots of the produce according to the fixed grade standards. Produce is graded in accordance with the various quality factors. The grading of Groundnut is beneficial to the farmers, traders as well as to the consumers.

Groundnut is chiefly used for the extraction of oil and to a small extent as spice. The quality of seeds is therefore, judged by certain factors, which yield the quality i.e. mainly pungency of the oil etc. There are a number of other factors which have a direct bearing on the yield and quality of the oil obtained from the Groundnuts i.e. size, colour, nature of damage of kernels, impurities and moisture content etc.

Groundnuts, grown in India falls under four main commercially important varieties, though they are marketed under a number of trade names. In some cases, the same variety is known by different names in different states.

Important commercial type of varieties:

(i) Coromondal : The nuts are smaller than those of the bold types and the pods have somewhat ill-defined constriction in the middle. The shell is thicker than in the case of the peanuts type but thinner than that of the bold types. The kernels are big in size, oval in shape and are covered with light, red-coloured skin, darkening with age.

(ii) Bold : The pods are larger than those of the coromondal types and the constriction is more well-defined. The shell is thicker than that of coromondal types. The kernels are oval, larger than those of the coromondal types and covered with light red-coloured skins which speedily darken.

(iii) Peanuts : The pods are smaller than those of coromondal and Bold types and have well pronounced constriction in the middle. The shell is thin and the kernels are small and round, and covered with light rose-coloured skin, which peels off easily and darkens with age.

(iv) Red natal : These are generally of the same size as that of peanuts types. The constriction in the pods is less pronounced than in the case of peanuts types. The kernels are round and have deep dark red coloured skin.

Factors to be considered for grading:

The grading factors are the same for all the varieties both in respect of unshelled (pods) and shelled (kernels) Groundnuts. There are as follows:

A) Unshelled Groundnuts: (i) Foreign matter, (ii) Damaged pods, (iii) Shrivelled and immature pods, (iv) Pods of other varieties, (v) Shelling percentage.

B) Shelled Groundnuts: (i) Foreign matter, (ii) Damaged kernels, (iii) slightly damages kernels, (iv) Shrivelled and immature kernels, (v) Splits and brokens, (vi) Nooks, (vii) Admixture of other varieties.

In addition to above, the produce shall have (a) the characteristic shape, configuration and appearance of the variety. (b) the season's crop, (c) not moist to touch, (d) not showing visible signs of insects and moulds, (e) free from extraneous matter and obnoxious smell.

Steps to be followed for Grading:

Steps	Groundnut pods	Groundnut kernels
1.Cleaning and sorting :	After arrival, entire produce should be cleaned and sorted manually/mechanically to separate the foreign matter, dust, dirt and stone particles, immature, brokens, shriveled, damaged and diseased pods.	After threshing of pods, entire kernels should be cleaned and sorted manually/mechanically to separate the foreign matter, dust, dirt and stone particles, immature, brokens, shriveled, damaged and diseased kernels and nooks.
2.Packing and sealing :	The cleaned and sorted homogeneous pods should be filled in gunny bags and then packed and sealed.	The cleaned and sorted homogeneous kernels are to be filled in gunny bags and then packed and sealed.
3.Sampling :	Grading of a lot, the drawing of truly representative sample is essential and it must represent the exact composition of the commodity. The sample should then be packed, coded and sealed.	Grading of a lot, the drawing of truly representative sample is essential and it must represent the exact composition of the commodity. The sample should then be packed, coded and sealed.
4.Analysis :	The analysis of the sample should be done as per prescribed grade specifications.	The analysis of the sample should be done as per prescribed grade specifications.
5.Grading and certification :	Grade is confirmed by analytical method and certificate is given on the basis of result of the analysis.	Grade is confirmed by analytical method and certificate is issued on the basis of result of the analysis.

Salient features of sampling:

1. Primary sample: Each sample drawn from the heap or bag by parkhi or tube sampler from a single position of the lot.
2. Composite sample: Primary samples drawn from the same lot shall be thoroughly mixed and blended to form homogeneous composite sample in a sample divider.
3. Test sample: One portion of composite sample weighing 500 gms is packed in cloth bag.
4. Sample for moisture: Part of the composite sample weighing about 150gms. packed in polythene bag and heat sealed kept in airtight container.
5. Labeling of sample: Appropriate labels are affixed with cloth bags and polythene bags samples showing the following particulars:
a) Name of the commodity and variety, b) Lot number,
c) Quantity, whether in bags or in bulk, d) Place and date of sampling,
e) Details of wagon/truck/warehouse in the case of bulk samples,
f) Name of sampling officer,
g) Signature.

Sampling procedure:

The Groundnut falls under the medium oilseed crop. The sample of Groundnut consignment may be taken from bulk and bags. The consignment should be broken in lots and sub-lots to get representative sample of the same species, variety, type, grade, source and the year of production. Depending on the size and uniformity of the lot, the number of sub-lots may be two or more as indicated for consignments in bags and in bulk in Table No. 4.

One representative gross sample shall be obtained from each sub-lot. Thus, there will be as many gross samples as the number of sub-lots in a lot. The samples for tests shall be prepared from the gross sample. In order to achieve randomness in selection of bags, the following procedure may be adopted:

"Starting from any bag count them in one order as 1,2,3….. up to r, r being the integral part of N/n, where 'N' is the total number of bags and 'n' the number of bags to be selected. Every rth bag thus counted is withdrawn to constitute the sample". The number of bags to be selected from each sub-lot shall be in accordance with Table N.4.

In the case of unbagged Groundnut, the sub-lots should be indicated by suitably marking the line of demarcation on the surface of a lot. The surface of each sub-lot should be then leveled to a height of less than 1.5 metres in various parts. A minimum of 50 samples shall be drawn with the help of the appropriate sampling instrument.

All the primary samples drawn from the same sub-lot shall be thoroughly mixed and blended to constitute a homogeneous composite sample. The minimum size of the gross sample shall be at least 2.5 kg. The composite sample shall be divided into three final samples for laboratory examination and three samples for determination of moisture. The weight of samples for laboratory examination and for moisture determination, it should be 600 gm. and 150 gm. respectively.

Table No.4 : Number of sub-lots for Groundnut in bags/bulk and scale of sampling.

Number of sub-lots for Groundnut in bags		Number of sub-lots for Groundnut in bulk		Scale of sampling for bagged Groundnut	
No. of bags in a lots	**Minimum No. of sub-lots**	**Weight of Groundnut in a lots**	**Minimum No. of sub-lots**	**No. of bags in the lots**	**No. of bags to be sampled**
Up to 300	2	Up to 30 tonnes	2	Up to 50	8
301 to 1,000	3	31 to 100 tonnes	3	51 to 100	13
1,001 to 3,000	4	1001 to 300 tonnes	4	101 to 150	20
3,001 and over	5	Over 300 tonnes	5	151 to 300	32
				301 & above	50

Source: Handbook on Grading of Foodgrains and Oilseeds, (Marketing Series-185), Directorate of Marketing & Inspection, Govt. of India.

3.4.1 Grade specifications :

I] Under AGMARK :

Under the Agricultural Produce (Grading and Marking) Act 1937, the grade specifications for Groundnut have been notified. Agmark standards for Groundnut are given below.

I. Grade Specification of Groundnut pods (unshelled) known commercially as Red Natals (*Arachis hypogaea*)

A) General characteristics :

The Groundnut pods shall have the characteristics shape, configuration and appearance of the variety commercially known as 'Red Natal", shall be of the season's crop, not moist to touch, shall not show visible, signs of insects and moulds and shall not have excessive dirt.

B) Special characteristics :

Grade designation	Maximum limit of tolerance				
	Foreign matter %	Damaged pods %	Shrivelled and Immature pods %	Pods of other varieties %	Shelling % (kernels/pods) minimum
1	2	3	4	5	6
Special	1.0	0.50	2.0	1.0	74
Standard	2.0	1.00	3.5	2.0	70
General	3.0	2.00	5.0	5.0	68

EXPLANATION :

1. "Foreign matter" means dust, dirt, stones, lumps of earth, chaff, stem, straw or any other impurity.
2. "Damaged pods" are those pods that are damaged mechanically or by mould, weevil or any other insect attack those showing internal discolouration of kernels materially affecting the quality of the pods.
3. "Shrivelled and immature pods" are those pods which are imperfectly developed.

NOTE :

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified each of the columns 2, 3 and 4 for Special, Standard and General grades, respectively and a tolerance of 1.0, 2.0 and 3.0 percent in excess of the specified tolerance in column 5 for Special, Standard and General grades respectively.

II. Grade Specification of Groundnut pods (unshelled) known commercially as bold (*Arachis hypogaea*)

A) General characteristics :

The Groundnut pods shall have the characteristics shape, configuration and appearance of the variety commercials known as 'Bold' shall be of the season's crop, not moisture to touch, shall not show visible signs of insects and moulds and shall not have excessive dirt.

B) Special characteristics :

Grade designation	Maximum limit of tolerance				
	Foreign matter %	Damaged pods %	Shrivelled and Immature pods %	Pods of other varieties %	Shelling % (kernels/ pods) minimum
1	2	3	4	5	6
Special	1.0	0.5	3.0	1.0	69
Standard	2.0	1.0	3.5	2.0	66
General	3.0	2.0	5.0	5.0	62

EXPLANATION :

1. "Foreign matter" means dust, dirt, stones, lumps of earth, chaff, stem, straw or any other impurity.
2. "Damaged pods" are those pods that are damaged mechanically or by mould, weevil or any other insect attached or those showing internal discolouration of kernels materially affecting the quality of the pods.
3. "Shrivelled and immature pods" are those pods which are imperfectly developed.

NOTE:

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified in each of the columns 2,3 and 4 for Special, Standard and General Grades respectively and a tolerance of 1.0, 2.0 and 3.0 per cent in excess of the specified tolerance in column 5 for Special, Standard and General grades respectively.

III. Grade Specification of Groundnut pods (unshelled) known commercially as 'Coromondal' (*Arachis hypogaea*)

A) General characteristics :

The Groundnut pods shall have the characteristic shape, configuration and appearance of the variety commercially known as 'coromondal' shall be of the season's crop, not moist to touch, shall not show visible, signs of insects and moulds and shall not have excessive dirt.

B) Special characteristics :

Grade designation	Maximum limit of tolerance				
	Foreign matter %	Damaged pods %	Shrivelled and Immature pods %	Pods of other varieties %	Shelling % (kernels/ pods) minimum
1	2	3	4	5	6
Special	1.0	0.5	2.0	1.0	70
Standard	2.0	1.0	3.5	2.0	67
General	3.0	2.0	5.0	5.0	64

EXPLANATION :

1. "Foreign matter" means dust, dirt, stones, lumps of earth, chaff, stem, straw or any other impurity.
2. "Damaged pods" are those pods that are damaged mechanically or by mould, weevil or any other insect attack are those showing internal discolouration of kernels materially affecting the quality of the pods.
3. "Shrivelled and immature pods" are those pods which are imperfectly developed.

NOTE :

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified in each of the columns 2, 3 and 4 for Special, Standard and General grades, respectively and a tolerance of 1.0, 2.0 and 3 per cent in excess of the specified tolerance in column 5 for Special, Standard and General grades respectively.

IV Grade Specification of Groundnut pods (unshelled) known commercially as 'Peanuts' (*Arachis hypogaea*)

A) General characteristics :

The Groundnut pods shall have the characteristic shape, configuration and appearance the variety commercially known as 'peanut' shall be of the season's crop, not moist to touch, shall not show visible, signs of insects and moulds and shall not have excessive dirt.

B) Special characteristics :

Grade designation	Maximum limit of tolerance				
	Foreign matter %	Damaged pods %	Shrivelled and Immature pods %	Pods of other varieties %	Shelling % (kernels/ pods) minimum
1	2	3	4	5	6
Special	1.0	0.5	2.0	1.0	72
Standard	2.0	1.0	3.5	2.0	69
General	3.0	2.0	5.0	5.0	66

EXPLANATION :

1. "Foreign matter" means dust, dirt, stones, lumps of earth, chaff, stem, straw or any other impurity.
2. "Damaged pods" are those pods that are damaged mechanically or by mould, weevil or any other insect attack are those showing internal discolouration of kernels materially affecting the quality of the pods.
3. "Shrivelled and immature pods" are those pods which are imperfectly developed.

NOTE :

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified in each of the columns 2, 3 and 4 for Special, Standard and General grades, respectively and a tolerance of 1.0, 2.0 and 3 per cent in excess of the specified tolerance in column 5 for Special, Standard and General grades respectively.

V. Grade Specification of Groundnut kernels commercially known as 'Red Natal/Peanuts' (*Arachis hypogaea*)

A) General characteristics :

The kernels shall have be obtained from pods of the variety 'Red Natal'/'Peanuts', shall have characteristics shape, configuration and appearance of the variety shall be of the season's crop, not moist to touch, shall not show visible signs of insects and moulds and shall be free from dirt and obnoxious smell.

B) Special characteristics :

Grade designation	Maximum limit of tolerance						
	Foreign matter %	Damaged pods %	Slightly damaged kernels %	Shrivelled and Immature kernels %	Splits and broken kernels %	Nooks %	Admixture of other varieties %
1	2	3	4	5	6	7	8
Special	1.0	0.5	0.5	2.0	5.0	1.0	1.0
Standard	2.0	1.0	1.0	4.0	10.0	2.0	2.0
General	3.0	2.0	2.0	6.0	15.0	3.0	5.0

EXPLANATION :

1. "Foreign matter" means pieces of particles of any extraneous substance other than Groundnut kernels and includes unshelled nuts, if any, which have to be shelled.
2. "Damaged kernels" are those kernels which are internally discoloured, discolouration materially affecting the quality.
3. "Slightly damaged kernels" are those kernels, which are discoloured only externally or partly without affecting the quality.
4. "Shrivelled and immature kernels" are those kernels which are imperfectly developed.
5. "Splits kernels" are those kernels broken into two halves/lengthwise and "broken kernels" are those kernels which are smaller than splits but bigger than Nooks.
6. "Nooks' means small parts of kernels, measuring $1/16^{th}$ or less of a whole kernel.

NOTE :

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified each of the columns 2, 3, 4, 5, 7 and 8 for Special, Standard and General grades, respectively and a tolerance of 1.0, 2.0 and 3 per cent in excess of the specified tolerance in column 6 for Special, Standard and General grades respectively.

VI. Grade Specification of Groundnut kernels commercially known as 'BOLD/Coromandal' (*Arachis hypogaea*)

A) General characteristics :

The kernels shall have be obtained from pods of the variety 'BOLD/Coromandal', shall have characteristics shape, configuration and appearance of the variety, shall be of the season's crop, not moist to touch, shall not show visible signs of insects and moulds and shall be free from dirt and obnoxious smell.

B) Special characteristics :

Grade designation	Maximum limit of tolerance						
	Foreign matter %	Damaged pods %	Slightly damaged kernels %	Shrivelled and Immature kernels %	Splits and broken kernels %	Nooks %	Admixture of other varieties %
1	2	3	4	5	6	7	8
Special	0.5	1.0	0.5	2.0	5.0	1.0	1.0
Standard	1.0	1.5	1.0	4.0	10.0	2.0	2.0
General	2.0	2.0	2.0	6.0	15.0	3.0	5.0

EXPLANATION :

1. "Foreign matter" means pieces or particles of any extraneous substance other than Groundnut kernels and includes unshelled nuts, if any, which have to be shelled.
2. "Damaged kernels" are those kernels which are internally discoloured, discolouration materially affecting the quality.
3. "Slightly damaged kernels" are those kernels, which are discoloured only externally or partly without affecting the quality.
4. "Shrivelled and immature kernels" are those kernels which are imperfectly developed.
5. "Splits kernels" are those kernels which are broken into two halves/lengthwise and "broken kernels" are those kernels which are smaller than splits but bigger than Nooks.
6. "Nooks' means small parts of kernels, measuring 1/16th or less of a whole kernel.

NOTE :

For accidental errors, a tolerance is permissible upto 0.25, 0.50 and 1.00 per cent in excess of the tolerance specified each of the columns 2, 3, 4, 5, 7 and 8 for Special, Standard and General grades, respectively and a tolerance of 1.0, 2.0 and 3.0 per cent in excess of the specified tolerance in column No. 6 for Special, Standard and General grades respectively.

Source: Agricultural Produce (Grading and Marking), Act, 1937 with Rules, made upto 31st December,1979, (Fifth Edition),(Marketing Series No.192), Directorate of Marketing and Inspection.

VII. Grade specification of Hand Picked Selected (HPS) Groundnut pods Commercially known as BOLD AND COROMANDEL

A) General characteristics :

The Hand picked Selected Groundnut Pods shall:
(a) be the pods obtained from the plant *Arachis hypogaea*:
(b) have characteristics shape, size, appearance and configuration of the Bold/Coromandel variety;
(c) be free from fungus and insect attack, live and/or dead insects, obnoxious smell, rodent contamination and excreta, larvae and pupae.

B) Special characteristics :

Grade designation	Definition of quality					
	Special characteristics					
	Extraneous matter percent by weight (maximum)	Immature and shriveled pods percent by weight (maximum)	Damaged and discolured pods percent by weight (maximum)	Pods of other varieties percent by weight (maximum)	Shelling percent by weight (minimum)	Moisture percent by weight (maximum)
1	2	3	4	5	6	7
Special	0.5	2.0	0.5	1.0	69	8.0
Standard	1.0	3.0	1.0	2.0	66	8.0
General	2.0	4.0	2.0	4.0	62	8.0

Definition:

1. **Extraneous matter** : means dust, lumps of earth, shell, dirt, stones, stem, straw or any other impurity or any other edible/non-edible oilseeds.
2. **Immature and shriveled pods** : are those pods which are imperfectly developed and/or shrunken.
3. **Damaged and discoloured pods** : are those pods that are damaged mechanically or by mould, weevil or any other insect attack or those showing internal discolouration materially affecting the quality.
4. **Pods of other varieties** : means the pods of other than the principal variety/type of groundnut.
5. **Shelling percent** : means the weight of kernels found in 100 grams of pods.

Note: Hand Picked Selected Groundnut pods shall be subject to Aflatoxin test only if there is specific demand from the foreign buyer.

VIII. Grade specification of Hand Picked selected (HPS) Groundnut pods commercially known as peanuts

A) General characteristics :

The Hand picked Selected Groundnut Pods shall:
(a) be the pods obtained from the plant *Arachis hypogaea*:
(b) have characteristics shape, size, appearance and configuration of the Peanuts variety;
(c) be free from fungus and insect attack, live and/or dead insects, obnoxious smell, rodent contamination and excreta, larvae and pupae.

B) Special characteristics :

Grade designation	Definition of quality					
	Special characteristics					
	Extraneous matter percent by weight (maximum)	Immature and shriveled pods percent by weight (maximum)	Damaged and discolured pods percent by weight (maximum)	Pods of other varieties percent by weight (maximum)	Shelling percent by weight (minimum)	Moisture percent by weight (maximum)
1	2	3	4	5	6	7
Special	0.5	2.0	0.5	1.0	72	8.0
Standard	1.0	3.0	1.0	2.0	69	8.0
General	2.0	4.0	2.0	4.0	66	8.0

Definition:

1. **Extraneous matter:** means dust, lumps of earth, shell, dirt, stones, stem, straw or any other impurity or any other edible/non-edible oilseeds.
2. **Immature and shriveled pods :** are those pods which are imperfectly developed and/or shrunken.
3. **Damaged and discoloured pods :** are those pods that are damaged mechanically or by mould, weevil or any other insect attack or those showing internal discolouration materially affecting the quality.
4. **Pods of other varieties :** means the pods of other than the principal variety/type of groundnut.
5. **Shelling percent :** means the weight of kernels found in 100 grams of pods.

NOTE:

Hand Picked Selected Groundnut pods shall be subject to Aflatoxin test only if there is specific demand from the foreign buyer.

IX. Grade specification of Hand selected (HPS) Groundnut pods commercially known as Red Natal

A) <u>General characteristics</u> :

The Hand picked Selected Groundnut Pods shall:

(a) be the pods obtained from the plant *Arachis hypogaea*:

(b) have characteristics shape, size, appearance and configuration of the RED NATAL variety;

(c) be free from fungus and insect attack, live and/or dead insects, obnoxious smell, rodent contamination and excreta, larvae and pupae.

B) <u>Special characteristics</u> :

Grade designation	Definition of quality					
	Special characteristics					
	Extraneous matter percent by weight (maximum)	Immature and shriveled pods percent by weight (maximum)	Damaged and discolured pods percent by weight (maximum)	Pods of other varieties percent by weight (maximum)	Shelling percent by weight (minimum)	Moisture percent by weight (maximum)
1	2	3	4	5	6	7
Special	0.5	2.0	0.5	1.0	75	8.0
Standard	1.0	3.0	1.0	2.0	70	8.0
General	2.0	4.0	2.0	4.0	68	8.0

Definition:

1. Extraneous matter: means dust, lumps of earth, shell, dirt, stones, stem, straw or any other impurity or any other edible/non-edible oilseeds.

2. Immature and shriveled pods : are those pods which are imperfectly developed and/or shrunken.

3. Damaged and discoloured pods : are those pods that are damaged mechanically or by mould, weevil or any other insect attack or those showing internal discolouration materially affecting the quality.

4. Pods of other varieties : means the pods of other than the principal variety/type of groundnut.

5. Shelling percent : means the weight of kernels found in 100 grams of pods.

NOTE:

Hand Picked Selected Groundnut pods shall be subject to Aflatoxin test only if there is specific demand from the foreign buyer.

X. Grade specification of Hand Picked Selected (HPS) Groundnut pods commercially known as BOLD and COROMANDEL (*Archis hypogaea*)

A) General characteristics:

The Hand Picked Selected Groundnut kernels shall:

(a) be obtained from the pods of the Bold/Coromandel variety;
(b) have characteristics shape, colour configuration and appearance of the variety;
(c) be dry, free from extraneous matter, living and/or dead insects, weevils, larvae, pupae, any visible mould and rodent contamination, and excreta,
(d) be free from rancidity, bitter taste obnoxious smell and deleterious substances; and
(e) be free from nooks.

B) Special characteristics:

Grade designation	Definition of quality			
	Special characteristics			
	No. of kernels per 25gm. maximum by count	Damaged and slightly damaged kernels percent by weight (maximum)	Broken including split kernels percent by weight (maximum)	Moisture percent by weight (maximum)
1	2	3	4	5
Special	50	0.5	0.50	7.0
Standard	55	0.5	1.00	7.0
Good	60	0.5	2.00	7.0
General*	As per contract between the buyer and the seller	0.5	2.00	7.0

Definition:

1. Damaged Kernels: are those kernels that are damaged mechanically or by mould, weevil, or any other insect attack or those showing internal discolouration of kernels materially affecting the quality,

2. Slightly damaged: are those kernels which are superficially affecting to the extent as to impair its appearance only.

3. Broken Kernels: means the kernels smaller than splits but bigger than nooks.

4. Split Kernels: means the kernels separated lengthwise into two complete halves only.

5. Nooks: means very small pieces of the kernels which are $1/8^{th}$ or less than $1/8^{th}$ of a whole kernel.

6. Extraneous matter: means dust, dirt, stones, lumps of earth, shell stem, straw or any other edible or non-edible seeds or any other impurity.

***** This grade has been provided to cover the buyers requirement in respect of No. of kernels per 25 gm. not covered under the other grades. HPS Groundnut under this grade shall be packed/exported only against specific order from the foreign buyer indicating the number of counts (kernels) per 25 gm.

NOTE:

HPS Groundnut meant for export shall be subject to Aflatoxin test only when there is specific demand from the foreign buyer.

XI. Grade specification of Hand Picked Selected (HPS) Groundnut pods commercially known as Peanut (*Archis hypogaea*)

A) General characteristics:

The Hand Picked Selected Groundnut kernels shall:

(a) be obtained from the pods of the peanut variety;
(b) have characteristics shape, colour configuration and appearance of the variety;
(c) be dry, free from extraneous matter, living and/or dead insects, weevils, larvae, pupae, any visible mould and rodent contamination, and excreta,
(d) be free from rancidity, bitter taste obnoxious smell and deleterious substances; and
(e) be free from nooks.

B) Special characteristics:

Grade designation	Definition of quality			
	Special characteristics			
	No. of kernels per 25gm. maximum by count	Damaged and slightly damaged kernels percent by weight (maximum)	Broken including split kernels percent by weight (maximum)	Moisture percent by weight (maximum)
1	2	3	4	5
Special	70	0.5	0.50	7.0
Standard	75	0.5	1.00	7.0
Good	80	0.5	2.00	7.0
General*	As per contract between the buyer and the seller	0.5	2.00	7.0

Definition:

1. Damaged Kernels: are those kernels that are damaged mechanically or by mould, weevil, or any other insect attack or those showing internal discolouration of kernels materially affecting the quality,

2. Slightly damaged: are those kernels which are superficially affected to the extent as to impair its appearance only.

3. Broken Kernels: means the kernels smaller than splits but bigger than nooks.

4. Split Kernels: means the kernels separated lengthwise into two complete halves only.

5. Nooks: means very small pieces of the kernels which are $1/8^{th}$ or less than $1/8^{th}$ of a whole kernel.

6. Extraneous matter: means dust, dirt, stones, lumps of earth, shell stem, straw or any other edible or non-edible seeds or any other impurity.

***** This grade has been provided to cover the buyers requirement in respect of "No. of kernels per 25 gm." not covered under the other grades. HPS Groundnut under this grade shall be packed/exported only against specific order from the foreign buyer indicating the number of counts (kernels) per 25 gm.

NOTE:

HPS Groundnut meant for export, shall be subject to Aflatoxin test only when there is specific demand from the foreign buyer.

XII. Grade specification of Hand Picked Selected (HPS) Groundnut kernels commercially known as Red Natal (*Archis hypogaea*)

A) General characteristics:

The Hand Picked Selected Groundnut kernels shall:

(a) be obtained from the pods of the Red Natal variety;
(b) have characteristics shape, colour configuration and appearance of the variety;
(c) be dry, free from extraneous matter, living and/or dead insects, weevils, larvae, pupae, any visible mould and rodent contamination, and excreta,
(d) be free from rancidity, bitter taste obnoxious smell and deleterious substances; and
(e) be free from nooks.

B) Special characteristics:

Grade designation	Definition of quality			
	Special characteristics			
	No. of kernels per 25gm. maximum by count	Damaged and slightly damaged kernels percent by weight (maximum)	Broken including split kernels percent by weight (maximum)	Moisture percent by weight (maximum)
1	2	3	4	5
Special	65	0.5	0.50	7.0
Standard	75	0.5	1.00	7.0
Good	80	0.5	2.00	7.0
General*	As per contract between the buyer and the seller	0.5	2.00	7.0

Definition:

1. Damaged Kernels: are those kernels that are damaged mechanically or by mould, weevil, or any other insect attack or those showing internal discolouration of kernels materially affecting the quality,

2. Slightly damaged: are those kernels which are superficially affecting to the extent as to impair its appearance only.

3. Broken Kernels: means the kernels smaller than splits but bigger than nooks.

4. Split Kernels: means the kernels separated lengthwise into two complete halves only.

5. Nooks: means very small pieces of the kernels which are $1/8^{th}$ or less than $1/8^{th}$ of a whole kernel.

6. Extraneous matter: means dust, dirt, stones, lumps of earth, shell stem, straw or any other edible or non-edible seeds or any other impurity.

***** This grade has been provided to cover the buyers requirement in respect of "No. of kernels per 25 gm." not covered under the other grades. HPS Groundnut under this grade shall be packed/exported only against specific order from the foreign buyer indicating the number of counts (kernels) per 25 gm.

NOTE:

HPS Groundnut meant for export shall be subject to Aflatoxin test only when there is specific demand from the foreign buyer.

Source: Agricultural Produce (Grading and Marking), Act, 1937 with Rules, made from 1st January,1980 to 31st March, 1985 (Compendium – Volume - II), embodying all amendments finally notified up to 31st March, 1985, (Marketing Series No.193), Directorate of Marketing and Inspection.

II] NAFED Grade specifications of groundnut – in – shell for price support operations during 2004 – 2005 marketing season

NAFED is the nodal agency of the Government of India for procuring Groundnut in different states under the Price Support Scheme (PSS). The concerned State Co-operative Marketing Federations are the procuring agents for NAFED. All the purchases under the PSS by NAFED are made in accordance with these specifications.

Sl. No.	Special characteristics	Maximum limits of tolerance (Percent by weight per qtl.) for	
		Bold	Ginny
		FAQ	FAQ
1.	Foreign matter	2	2
2.	Damaged pods	2	2
3.	Shrivelled & immature pods	4	4
4.	Pods of other varieties	4	4
5.	Shelling (kernels / pods)	65 & above	70 & above
6.	Moisture contents	8	8

DEFINITIONS:

1. Foreign matters means dust, dirt, stones, lumps of earth, chaff, stem, straw or any other impurity.
2. Damaged pods are those pods that are damaged mechanically or by mould, weevil or any other insect attack or those showing internal discolouration of kernels materially affecting the quality of the pods.
3. Shivelled and immature pods are those pods which are imperfectly developed.

Source: Action plan and operational arrangements for Price Support Scheme in Rabi, 2004, NAFED, New Delhi.

III] Specification under Prevention of Food Adulteration Rules, 1955.

Groundnut Kernel (deshelled) for direct human consumption commonly known as Moongphali are obtained from the plant *Arachis hypogaea*. The kernels shall be free from non-edible seeds such as mahua, castor, neem or argemone, etc. It shall be free from colouring matter and preservatives. It shall be practically free from extraneous matter such as stones, dirt, clay etc. The kernels shall conform to the following standards, namely:-

(a) Moisture	Not more than 7.0 per cent
(b) Damaged kernel including slightly damaged kernel	Not more than 5.0 per cent by weight
(c) Aflatoxin content	Not more than 30 parts per billion

Source: The Prevention of Food Adulteration Act, 1954, 2004.

IV] CODEX STANDARDS :

CODEX STANDARD FOR PEANUTS
CODEX STAN 200-1995

The Annex to this standard contains provisions which are not intended to be applied within the meaning of the acceptance provisions of Section 4.A (I)(b) of the General Principles of the Codex Alimentarius.

1. **SCOPE:**

This standard applies to peanuts as defined in Section 2 intended for processing for direct human consumption.

2. **DESCRIPTION:**

2.1 **Definition of the Product:**

Peanuts, either in the pod or in the form of kernels, are obtained from varieties of the species *Arachis hypogaea* L.

3. **ESSENTIAL COMPOSITION AND QUALITY FACTORS:**

3.1 **Quality Factors – General :**

3.1.1 Peanuts shall be safe and suitable for processing for human consumption.

3.1.2 Peanuts shall be free from abnormal flavours, odours, living insects and mites.

3.2 **Quality Factors – Specific**

3.2.1 **Moisture Content**	Maximum Level
Peanuts in-pod	10%
Peanut kernels	9.0%

Lower moisture limits should be required for certain destinations in relation to the climate, duration of transport and storage. Governments accepting the Standard are requested to indicate and justify the requirements in force in their country.

3.2.2 **Mouldy, rancid or decayed kernels** 0.2% m/m max.

Mouldy kernels are defined as kernels with mould filaments visible to the naked eye.

Decayed kernels are defined as those showing visibly significant decomposition.

Rancid kernels are defined as those which have undergone oxidation of lipids (should not exceed 5 meq active oxygen/kg) or the production of free fatty acids (should not exceed 1.0%) resulting in the production of disagreeable flavours.

3.2.3 Organic and inorganic extraneous matter: is defined as organic or inorganic components other than peanuts and includes stones, dust, seeds, stems, etc.

3.2.3.1 **Filth:**

Impurities of animal origin (including dead insects)	0.1% m/m max.

3.2.3.2 **Other organic and inorganic extraneous matter**

Peanuts in-pod	0.5% m/m max.
Peanut kernels	0.5% m/m max.

4. **CONTAMINANTS* :**

4.1 **Heavy Metals**

The products covered by the provisions of this standard shall be free from heavy metals in amounts which may represent a hazard to human health.

4.2 **Pesticide Residues**

Peanuts shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

5. **HYGIENE:**

5.1 It is recommended that the product covered by the provisions of this standard should be prepared in accordance with the appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene" (CAC/RCP 1-1969, Rev. 2-1985), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to this product.

5.2 To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.

5.3 When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health.
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms, including fungi, in mounts which may represent a hazard to health.

6. **PACKAGING:**

6.1 Peanuts shall be packaged in such manner which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. Packaging will be sound, clean, dry, and free from insect infestation or fungal contamination.

6.2 Packing material shall be made of substances which are safe and suitable for their intended use, including new clean jute bags, tinplate containers, plastic or paper boxes or bags. They should not impart any toxic substance or undesirable odour or flavour to the product.

6.3 When the product is packaged in sacks, these must be clean, sturdy, and strongly sewn or sealed.

7. **LABELLING:**

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Rev. 1-1991, Codex Alimentarius Volume 1A), the following specific provisions apply:

7.1 **The Name of the Product**

The name of the product to be shown on the label shall be "peanuts" or "peanuts in-pod" and type of peanuts.

7.2 **Labelling of Non-Retail Containers**

Information for non-retail containers shall either be given either on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot

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* A Proposed Draft Guideline Level for Total Aflatoxin in Peanuts intended for further processing is under elaboration.

identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

8. **METHODS OF ANALYSIS AND SAMPLING:**
See Codex Alimentarius Volume 13.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given it is strongly recommended that users specify the appropriate limit and method of analysis.

FACTOR/DESCRIPTION	LIMIT	METHOD OF ANALYSIS
1. In-Pod Defects		
1.1 Empty pods: pods containing no kernels.	3% m/m	To be determined
1.2 Damaged Pods: include: a) shrivelled pods (pods which are imperfectly developed and shrunken); or b) pods having cracks or broken areas which cause conspicuous openings or which seriously weaken a large portion of the pod, especially if the kernel inside the pod is easily visible without any pressure forced upon the edges of the crack.	10% m/m	To be determined
1.3 Discoloured Pods: pods having dark discolouration caused by mildew, staining, or other means affecting 50% or more of the pod surface.	2% m/m	To be determined
2. Kernel Defects		To be determined
2.1 Damaged Kernels include: a) those affected by freezing injury causing hard, translucent or discoloured flesh; b) shrivelled kernels which are imperfectly developed and shrunken; and/or c) those damaged by insects, worm cuts; d) mechanical damage; e) germinated kernels.	 1% m/m 5% m/m 2% m/m 2% m/m 2% m/m	
2.2 Discoloured Kernels: kernels are not damaged but are affected by one or more of the following: a) flesh (cotyledon) discolouration which is darker than a light yellow colour or consists of more than a slight yellow pitting of the flesh; and/or b) skin discolouration which is dark brown, dark grey, dark blue, or black, and covers more than 25% of the kernel.	3% m/m	To be determined
2.3 Broken and Split Kernels: broken kernels are those from which more than a quarter has been broken off. Split kernels have been split into halves.	3% m/m	To be determined
3. Peanuts other than the designated type.	5% m/m	To be determined

Source : www.codexalimentarius.net

3.4.2 Adulterants and Toxins:

A) Adulterants:

Although, Groundnut adulterated by some interior quality foreign matter and poisonous chemical but fungal as well as natural contamination are the major factor of adulteration. The common adulterants found in Groundnut are given bellow.

Adulterants	Health effects
1. Admixture: sand, stones etc.	Damages in digestive tract.
2. Chemicals: Residues on contaminated kernels like arsenic, lead, copper, zinc, tin cadmium, mercury and pesticide residues (beyond safe limit.)	Diarrhea, vomiting, paralysis, damage to brain, kidney and leaver.
3. Fungal: mycotoxins in moist kernels due to mould formation from aspergillums, fusarium, penicillium etc.	Causes carcinogenic, mutagenic immunosuppressive effects on health.
4. Microbiological :	
I. E.Coli (occasional contaminant)	Severe diarrhea, vomiting and abdominal pain.
II. Salmonella (rare contaminant)	Injurious to health, symptoms of fever and chills.
III. Bacterial Soft rot. Erwinia carotovora and related spp. IV. Gray moldrot – Botrytis cinerea V. Rhizopus softrot – Rhizopus nigricans VI. Cottony leak of beans	The diseases caused by pathogens and the decompositions caused by other organisms are of chief interest although clear – distinction between these types of organisms is not possible. There is moreover, an array of microbial diseases in the field that affect the pods and perhaps the seeds, e.g. anthracnose, blights, wilts, scab, rust etc. cottony leak or wilt caused by phythium butleri which gives the pods a white and cottony appearance.

B) Toxins:

Aflatoxins are the type of mycotoxins, which are derived from the fungi and affect human health. Usually, Aflatoxins in Groundnut are produced by *Aspergillus flavus,* and *Aspergillus parasiticus.* Contamination of Aflatoxins occurs at any stage from field to storage, whenever environmental conditions are conducive for fungi. The fungi, are generally regarded as storage fungi, which grow under conditions of relatively high moisture/humidity. It has been reported to cause liver damage and both liver and intestinal cancer in humans.

Groundnut is one of the crops, which is vulnerable to attack of Aflatoxin. Aflatoxin may grow on Groundnut kernels, if the moisture content is above 8 to 9 percent. Aflatoxin often grows in ships cargo during transit of more than 4 to 6 weeks. Aflatoxin contamination of Groundnut is a major health hazard to human and animals and it is one of the most important constraints in Groundnut trade.

The main reason for the contamination in Groundnut is due to poor pre-harvest and post-harvest practices like moisture stressed crop, stacking the pods/kernels in high humid conditions, which leads to growth of the fungus. Groundnut is usually stored in the pod, which facilitate insects to damage the pods and ultimately it encourages development of the fungus. In the international Groundnut trade, tolerance levels are specific for this quality parameter, with strict condition posed for Groundnut meant Pfor human consumption (4 ppb in Europe) and slightly lenient for bird feed.

*** Effects of Aflatoxin:**

On human

1. It is carcinogenic and may cause liver, intestinal and other cancer in human.
2. It reduces the immunity.
3. It imposts growth in children and may causes childhood cirrhosis.
4. It may cause abdominal pain and vomiting.

On animal

1. It may contaminate the milk.
2. It may reduce the animal productivity.
3. It may reduce the egg production in poultry.

Source: www.aflatoxin.info

*** Causes of Aflatoxin contamination :**

i. Growing of susceptible varieties.
ii. Premature harvesting.
iii. Mechanical injury to the pod/kernels during post-harvest operation.
iv. Storage of pods at high moisture i.e. more than 8 percent.
v. Insects damage during storage.
vi. Storing pods alongwith haulms.
vii. Storage-factors like floor or roof moisture, no ventilation, etc.

*** Control measures of Aflatoxins :**

a) Produce resistant varieties to Aflatoxins.
b) Harvest the crop after proper maturity time.
c) Dry the harvested pods properly.
d) Process immediately after post-harvest.
e) Avoid heaping or stacking of harvested produce.
f) Provide scientific storage facilities.
g) Keep the moisture level of groundnut less than 8 percent before storage.
h) The gunny bags should be staked on wooden planks to avoid dampness.
i) Avoid mechanical/handling damage to pods/kernels during post-harvest operations.
j) Eradicate insect damaged/contaminated pods and kernels before storage and processing.
k) Adopt grading to separate fully matured pods from immature pods.
l) Train and educate the farmers, consumers, traders/processors to improve the awareness of control measures.
m) Keep hygienic conditions at storage site.

3.4.3 Grading at producers' level :

The scheme, "Grading at Producers' level" was launced in 1962-63 by Directorate of Marketing and Inspection (DMI). The main objective of this scheme aims it to subject the produce to simple tests and assign a grade before it is offered for sale. The programme is being implemented by the State Governments, for which 1979 grading units were set up in the country upto 31-03-2004. During the year 2003-04, about 292244 tonnes Groundnut kernels of valued at Rs. 53661.04 lakh and about 85416 tonnes of Groundnut pods valued at Rs. 9118.31 lakh were graded at producers' level. State-wise quantity of kernel and pods graded and estimated value, during 2003-04 has been furnished the following table.

Table No.5 : State-wise quantity of Groundnut kernel and pods graded and estimated value, during 2003-04.

(Quantity : in tonnes and value : in lakh Rs.)

State	Groundnut kernels		Groundnut pods	
	Quantity	Value	Quantity	Value
Andhra Pradesh	97893	17480.41	20591	3446.00
Gujarat	16591	2854.65	---	---
Karnataka	76503	12586.36	---	---
Maharashtra	4520	760.75	---	---
Rajasthan	1268	209.11	---	---
Tamil Nadu	89143	18536.84	64825	5672.31
Uttar Pradesh	6326	1232.92	---	---
Total	292244	53661.04	85416	9118.31

Source: Agmark Grading Statistics, 2003-04, Directorate of Marketing & Inspection, Faridabad.

3.4 Packaging:

Good packaging provides convenience in handling during transportation and storage. It is essential to maintain the quality and to avoid spoilage in Groundnut. Groundnuts generally, pack in pod form because kernel forms losses viability early than the pod form. Only Groundnut used for table purposes as well as for seed purposes are packed in kernel form. National Agricultural Co-operative Marketing Federation of India Limited (NAFED) usually packs Groundnut pods in DW/B-Twill jute bags with the capacity of 35 Kg. Some times polythene impregnated jute bags and HDPE/pp bags are also used for packing. Domestic consumption purpose and for roasted Groundnut, poly pouches and paper packages are used while; cloth bags are used for seed kernels.

Criteria for selection of packaging material:

Packaging material should be;

1) Suitable according to transportation and storage method.
2) Suitable according to climatic and environmental conditions.
3) Safe to handle during transportation.
4) Cheap, economical, readily available, easy to handle and store.
5) Convenient and suit the need of the customer.
6) Attractive for display.
7) Environment friendly and biodegradable.
8) Convenient to stack.
9) Protective to the produce.
10) Conform to the requirements as laid down under PFA standards as amended from time to time.

3.6 Transportation:

Groundnut usually transported in bulk at farm level, while at market level, it is transported both in bulk and bags. Inadequate and inefficient transportation system increases the qualitative and quantitative losses and increases the cost of marketing. The following means of transportation are used at different stages of marketing.

Means of transportation used at different stages of marketing.

Stage of Marketing	Transportation by	Means of Transport
1. From field to the village market or primary market.	**Farmer**	By Head load, Pack animal, Bullock cart or Tractor's trolley.
2. From primary market to secondary whole sale market and miller	**Traders / millers**	By Trucks, Railway wagons.
3. From miller and wholesale markets to retailer	**Millers / retailers**	By Trucks, Railway wagons, Mini trucks.
4. From retailer to consumer	**Consumer**	By Head loads, Pack animal, Bullock / Hand cart, Rickshaw.
5. For Export	**Exporter/trader**	By Ship, Air Cargo

Availability of cheaper and convenient modes of transport:

Road and rail transport are normally used for internal markets, whereas, for export markets, the mode of transport is by Sea. The most common modes of transportation are;

1) Road : Road transport is the most popular means for movement for Groundnut to the assembling markets as well as to the distribution centers. The following means of road transport are employed in different parts of the country to transport Groundnut.

a) Bullock / camel carts:

Benefits;

1. Cheap and easily available.
2. Good for small quantity of produce.
3. Easy transport for short distance.
4. Operational cost is low.
5. Easily manufactured by village artisan.
6. It can be operated on *kaccha* road, muddy or sandy path.

b) Tractor trolley:

Benefits;

1. Carry larger quantity of produce than bullock carts in less time.
2. Suits to carry produce in primary assembling markets in the absence of proper *pucca* road connecting the villages and market.

c) Trucks: The movement of Groundnut from assembling markets to the secondary markets and consuming markets is invariably by trucks. The truck is the most convenient mode of transport throughout the country for longer distances for bulk quantity than railway wagons.

Benefits;

1. Easy availability.
2. Time saving.
3. Quick movement.

4. Door to door delivery.
5. Comparatively cheaper for short / medium distances.
6. Suites for smaller quantities.
7. Flexibility in operation.
8. Minimise transit losses due to least handling of loading and unloading

2) Rail:

Benefits;

1. Suit for carrying larger quantity of produce.
2. Suit for long distances through out India.
3. Comparatively cheaper and safer mode of transport.

3.7 Storage:

Storage provides protection against weather, moisture, insects, micro-organisms, rats, birds and any type of infestation and contamination. Usually, farmers sellout their produce immediately after harvesting. Some farmers store the Groundnut for some period to get remunerative price and for seed purposes. Pods are stored, in bulk, loose and in gunny bags, whereas kernels are stored in bags or any other container. Kernels kept in bags are more susceptible to damage by dampness and pests. Pods are shelled few days before it is for crushing or edible purpose. The filled bags are stacked on wooden planks or plastic sheets spread over the floor to avoid dampness.

Basic requirements for safe and scientific storage:

i)	**Selection of site :**	The storage structure should be located on a raised well-drained site. It should be easily accessible. The land of the site should be protected from moisture, excessive heat, insects, rodents, and bad weather conditions.
ii)	**Selection of: storage structure**	The storage structure should be selected according to quantity of Groundnut to be stored. In godowns, sufficient space should be provided between two stacks for proper aeration. It should be stored on *pucca* floor to avoid dampness.
iii)	**Cleaning and: fumigation**	Storage structure should be clean. There should be no left-over grains, cracks, holes and crevices in the structure. The structure should be fumigated before storage.
iv)	**Drying and: cleaning**	Before storage, Groundnut should be properly cleaned and dried up to optimum moisture percentage to avoid dampness. Do not store damaged or infested pods/kernels along with fresh ones to avoid quality deterioration.
v)	**Cleaning of bags :**	Always use new and dry gunny bags. Disinfect the old gunny bags by boiling in 1 percent Malathion solution for 3-4. minutes and dry it.
vi)	**Separate storage: of new and old stock**	To check infestation and to maintain hygienic condition, the new and old stocks should be store separately.

vii) **Use of dunnage :** Bags of Groundnut should be kept on wooden planks or bamboo mats along with a cover of polythene sheet to avoid absorption of moisture from the floor.

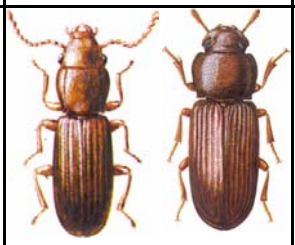
viii) **Proper aeration :** There should be proper aeration during clean weather condition but care should be taken to avoid aeration in rainy season. Each stack should have ten layers preferably.

ix) **Cleaning of: vehicles** The vehicles used for transportation of Groundnut should be cleaned by phenyl to avoid infestation.

x) **Regular Inspection :** To maintain proper health and hygiene of stock, regular inspection of stored Groundnut is essential.

3.7.1 Major storage pests and their control measures :

Considerable both qualitatively and quantitatively losses occur in Groundnut due to damage by number of pests. The major stored pests of Groundnut along with their control measures are given below.

Name of pest	Figure of pest	Damage	Control measures
1. Groundnut borer/bruchid *Caryedon serratus* (oliver)		Larvae bore the pod wall and feed on the kernels and continue eating during transportation and storage.	1. Maintenance of optimum moisture content (not >5%) is always critical in preventing the development of storage pests. 2. For protection against storage pests, except for the groundnut bruchid, groundnuts should be stored unshelled. 3. Fumigation with celphons - 3g tablet per sack of groundnut (40 kg) - and covering the sacks with a polythene sheet for 5 days can effectively control bruchids without affecting seed viability. 4. If groundnuts are stored as seed, care should be taken to avoid breakage. 5. Broken seeds should not be stored for long periods. 6. Dusting with an inert substance such as attapulgite-based clay dust (ABCD) can help to minimize storage insect problems.
2. Red rust/Confused flour beetle *Tribolium castaneum (Herbst.) Tribolium confusum (J.du V.)*	 **Red rust Flour Beetle** **Confused Flour Beetle**	Beetle and larvae both do not cause damage to whole pod but feed on broken and damaged pod/kernel produced by milling and handling or attacks on infested /damaged pods of other insects.	
3. Rice moth *Corcyra cephalonica*		Larvae feed on broken and damaged pods and kernels. Larvae produce dense webbings. Whole kernels are bound into lumps.	
4. Pod-sucking bug *Elasmolomus sordidus*		Nymphs perforate the pod and feed on the kernels. Kernels shrivel it increases the free fatty acid content of the oil.	

5. Rodents		Rodents eat whole pods and kernels. They spill more pods and kernels than they consume. Rodents also contaminate Groundnut by hair, urine and feces, which cause diseases like cholera, food poisoning, ringworm, rabies etc.	**Rat cage :** Different types of rat cages are available in the market. Caught rats can be killed by dipping into water. **Poison baits :** Anti-coagulant pesticide like Zinc Phosphide is mixed with bread or any other food stuff used as bait. Keep baits for a week. **Rat burrow fumigation:** Put tablets of Aluminum Phosphide in each hole and burrow and block that hole by mud mixture to make it airtight.

3.7.2 Storage structures:

1.Metal drums : Made up with iron sheets in cylindrical and square shape with various sizes.

2.Improved bins : Different organisations developed and designed improved storage structures for scientific storage, which are moisture resistant and rodent-proof. These are:

a) Pusa Kothi c) Nanda bins e) PKV bins
b) PAU bins d) Hapur Kothi f) Chittore stone bins etc.

3. Pucca godown : These are made by brick-walls with cemented flooring for storing Groundnut in bulk and bags.

3.7.3 Storage facilities :

I) Producers' storage :

Producers store Groundnut in pod and kernel form at farm godown or in their own house using various types of traditional and improved structures. Generally, these storage containers are used for short period. Different organisations/institutions developed improved structures for Groundnut storage with various capacities like Hapur Kothi, Pusa bin, Nanda bin, PKV bin, etc. Some producers also pack Groundnut in jute gunny bags or in gunny bags lined with polythene and stack in room.

II) Rural godowns :

Considering the importance of rural storage in marketing of agricultural produce, the Directorate of Marketing and Inspection initiated a Rural Godowns Scheme in collaboration with NABARD and NCDC. Its objective is to construct scientific storage godowns with allied facilities in rural areas and to establish a network of rural godowns in the States and Union Territories. The main objectives of Rural Godowns Scheme are as under:

1. Creation of scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, consumer articles and agricultural inputs;

2. Promotion of grading, standardization and quality control of agricultural produce to improve their marketability;
3. Strengthen agricultural marketing infrastructure in the country by paving the way for the introduction of a national system of warehouse receipts in the respect of agricultural commodities stored in such godowns;
4. Prevention of distress sale immediately after harvest by providing the facility of pledge financing and marketing credit; and
5. Reverse the declining trend of investment in the agriculture sector by encouraging the private and co-operative sectors to invest in the creation of storage infrastructure in the country.

III) Mandi godowns :

Generally, Groundnut is stored in bags quantity in every mandi. Most of the States and Union Territories have enacted Agricultural Produce Marketing (Regulation) Acts. The APMCs constructed storage godowns in the market yards. At the time of keeping produce in godown, a receipt is issued indicating the quality and weight of produce stored. The receipt is treated as negotiable instrument and eligible for pledge finance. The CWC and SWCs were also allowed to construct godowns in the market yards. Co-operative societies also constructed godowns in the market yards, in producing and consuming areas/markets. Traders/millers also have their permanent storage godowns or warehouses.

IV) Central Warehousing Corporation (CWC) :

CWC was established during 1957. It is the largest public warehouse operator in the country. On June, 30th 2004, CWC operated 467 warehouses in the country. It has 16 regions, covering 25 States and Union Territories, with a total storage capacity of 9591443 tonnes. State-wise storage capacity with CWC as on 30-06-2004 is given below.

Table No.6 : State-wise storage capacity with CWC as on 30-06-2004.

Name of State	No of warehouses	Total capacity (in tonnes)
1.Assam	5	47630
2.Andhra Pradesh	48	1334908
3.Bihar	12	92179
4.Chandigarh	1	13602
5.Chhattisgarh	10	256825
6.Delhi	11	141342
7.Goa	2	30400
8.Gujarat	30	661792
9.Haryana	25	458439
10.Himachal Pradesh	3	7040
11.Jharkhand	3	33950
12.Karnataka	32	439574
13.Kerala	9	118939
14.Madhya Pradesh	31	703783
15.Maharashtra	51	1319136
16.Nagaland	1	13000

17.Orissa	11	188206
18.Pondicherry	1	12567
19.Punjab	31	808328
20.Rajasthan	26	354275
21.Tamil Nadu	26	694650
22.Tripura	2	24000
23.Uttaranchal	7	75490
24.Uttar Pradesh	50	1135167
25.West Bengal	39	626221
Total	**467**	**9591443**

Source : Central Warehousing Corporation, New Delhi.

V) State Warehousing Corporations (SWCs) :

Various States have set up their own warehouses in the country. The area of operation of the State Warehousing Corporations is district places of the State. The total share capital of the State Warehousing Corporations is contributed equally by the Central Warehousing Corporation and concerned State Government. The SWCs are under the dual control of the State Government and the CWC. At the end of June 2004, SWCs were operating 1585 warehouses in the country with the total capacity of 200.46 lakh tonnes. The State-wise storage capacities with SWCs as on June, 2004 are given below.

Table No.7 : State-wise storage capacity with SWCs as on 30th June 2004.

Name of SWC	No. of warehouses	Total capacity (in lakh tonnes)
1. Andhra Pradesh	144	22.79
2. Assam	43	2.60
3. Bihar	44	2.19
4. Gujarat	47	1.58
5. Haryana	113	20.48
6. Karnataka	112	6.55
7. Kerala	63	1.88
8. Madhya Pradesh	230	12.45
9. Maharashtra	166	11.62
10.Meghalaya	5	0.11
11.Orissa	60	4.10
12.Punjab	117	62.57
13.Rajasthan	87	7.07
14.Tamil Nadu	65	6.24
15.Uttar Pradesh	156	29.31
16.West Bengal	32	2.62
17.Chhattisgarh	101	6.30
Grand Total	**1585**	**200.46**

Source : Central Warehousing Corporation, New Delhi

VI) Co-operatives :

Co-operative storage facilities are provided to the producer at cheaper rates, which reduces the storage cost. These co-operatives also provide pledge loan against the produce and storage is more systematic and scientific than traditional storage. Financial assistance and subsidies are provided by Government organisations/banks to build co-operative storage.

To meet the increasing need for storage capacity, the National Co-operative Development Corporation (NCDC) encourages construction of storage facilities by co-operatives, particularly at rural and market level. The number and capacity of co-operative godowns assisted by NCDC in major states are given below.

Table No. 8 : State-wise co-operative storage facilities as on 31-3-2004.

Name of State	Rural level	Market level	Total capacity (in tones)
1. Andhra Pradesh	4003	571	690470
2. Assam	770	264	298900
3. Bihar	2455	496	557600
4. Gujarat	1815	401	372100
5. Haryana	1454	376	693960
6. Himachal Pradesh	1640	209	204800
7. Karnataka	4958	930	963590
8. Kerala	1959	133	323335
9. Madhya Pradesh	5166	1024	1305900
10.Maharashtra	3852	1492	2010920
11.Orissa	1951	595	486780
12.Punjab	3884	830	1986690
13.Rajasthan	4308	378	496120
14.Tamil Nadu	4757	469	956578
15.Uttar Pradesh	9244	762	1913450
16.West Bengal	2834	469	483060
17.Other States	1046	263	374830
Grand Total	**56096**	**9602**	**14119083**

Source: National Co-operative Development Corporation, New Delhi.

3.7.4 Pledge finance system :

The farmers are often compelled to sell their produce immediately after harvest, in the absence of assured market finance at reasonable rate of interest. To avoid such distress sale, Government of India, promoted Pledge Finance Scheme through a network of rural godowns and negotiable warehouse receipt system. Through this scheme, small and marginal farmers can get immediate financial support to meet their requirements and retain the produce till they get remunerative price.

According to the RBI guidelines, loan/advances upto 75 percent of the value of the produce stored in the godown can be advanced to farmers against pledge/hypothecation of agricultural produce (including warehouse receipts) subject to a ceiling of Rs. 1 lakh per borrower. Such loan shall be for a period of 6 months, which can be extended upto 12 months based on financing banks commercial judgment. The commercial/co-operative banks/RRBs provide credit to the farmers for the produce stored in the godown under this scheme. The banking institutions accept the godown receipt on its being duly endorsed and delivered to bank for pledge loan against hypothecation of produce as per RBI guidelines. Farmers are given freedom to take back their produce once the pledge loan is repaid. Facility of pledge finance is extended to all farmers, whether they are the borrowing members of Primary Agricultural Credit Societies (PACS) or not. The District Central Co-operative Banks (DCCBs) directly finance individual farmers on the strength of the pledge.

Benefits :

- Increases the retention capacity of the small farmers to avoid distress sale.
- Minimises the farmers' dependence on the commission agents as the pledge finance provides financial support to them immediately after harvest period.
- Participation of the farmers, irrespective of their land holding, helps in increasing the arrivals in market yards.
- Gives a sense of security to the farmers even if their produce is not sold out in the market yard immediately.

4.0 MARKETING PRACTICES AND CONSTRAINTS

4.1 Assembling :

Karnataka, Andhra Pradesh, Gujarat, Tamil Nadu and Maharashtra are the important States in the country in terms of production and market arrivals.

4.1.1 Major assembling markets :

The following are the major assembling markets for Groundnut producing states in the country.

State	Major assembling markets
ANDHRA PRADESH	Karim Nagar, Jogityal, Jannikunta, Nizamabad, Warangal, Kesanudrah, Nahaboobagad, Suryapet, Miryalaguda, Kadapa, Prodductor, Markapur, Kandokor, Tandur, Vikarabad, Pargi, Pondur, Rajan, Srikakulam, Mahaboobnagar, Badepally, Gadwal, Narayanapet, Kurnool, Adoni, Dhone, Anantapur, Hindupur, Kadiri, Kalyandurgh, Tadipatri.
GUJRAT	Junagarh, Kodinar, Mangrol, Kalvad, Angar, Chitra Bhavnagar, Mahura, Mahuva, Amreli, Rajkot, Gondas

KARNATAKA	Belgaum, Athni, Bailhongal, Gokak, Saundatti, Nadgad, Sankeshvar, Ramdurg, Katkol, Bidar, Hommabad, Chithguptpo, Bagalkot, Bijapur, Dharwar, Gadag, Hubli, Laxmeshwar, Haveri, Ranebennur, Mundargi, Gajendragad, Gulbarga, chittapur, Yadgiri, Raichur, Kappal, Shimoga, Sagar, Bangalore, Cahnnapatna, Bellary, Hospet, Chickmagalur, Chitaldurga, Devangere, Challakera, Harihar, Hassan Arsikera, Bellur, Chintamani, Mysore, Tumkur, Tiptur, Madhugir, Sirsi
TAMIL NADU	Villupuram, Kallakurichi, Thirikovilur, Gingee, Dindivanam, Cuddalore, Virudhachalam, Thiruvanaanala, Arni, Cheyyar, Vikkorravandi,Wundpet, Vandavasi, Chetpet.
MAHARASHTRA	Akalkot, Barsi, Karmala, Akluj, Pandharpur, sholapur, Kopergaon, Rahuri, Shrirampur, Shegaon, Ahmednagar, Chalisgaon, Jalgaon, Pachora, Amalner, Chopda, Bhusaval, Raver, Dhulia, Dondaiche, Nandurbar, Shirpur, Shahada, Kolhapur, Gadhinglaj, Vadgaon, Satana, Lasalgaon, Yeola, Baramati, sirur, Tasgaon, Akola, Karnaja, Akot, Amravati, dhanangaon, Gondia, Khamgaon, Malkapur, Nandura, Mehkar, Shegaon, Wardha, Yeotmal, Umerkhed, Wani, Aurangabad, Jalan, Latur, Vaijapur, Bhir, dharur, Manjilegaon, Nanded, Deglur, Loha Kallam, Latur, Udgir, Osmanabad, Nilanga, Parbhani, Gangakhed, Hingoli, Partur, Sailu, Manwath.
MADHYA PRADESH & CHATTISGARH:-	Raipur, Damoh, Anjad, Barwah, Khetia, Khargaon, Bamora, Bhind, Laskar, Dabra, Morena, Ujjain, Khachraud, Mahidpur, Baranagar, Bhilsa (Vidisha), Basoda, Sironj, Guna, Dewas, Ashok Nagar, Mungaoli, Indore, Mandsaur, Jawad, Neemuch, Piplia, Narsinghagarh, Ratlam, Akodia, Shivpuri, Manawar, Raigarh, Burhanpur, Tikamgarh, Ashta.
RAJASTHAN	Alwar, Kherli, Bhratpur, Dholpur, Bhilwara, Jaipur, Hindon, Gangapur, Tonk, Bikaner, Srigangangar, Raisinghnagar, Srikaranpur, Hanumangarh, Jodhpur, Summer, Metrta city, Pali, Udaipur, Fatehnagar, Ajmer, Mandaganj, Kishangarh, Beawar, Kekri, Bundi, Nimbahera, Bhawani Mandi, Kota, Ramganj Mandi
UTTAR PRADESH & UTTARANCHAL	Choharpur, Dehradum, Kotdwar, Kashipur, Ramnagar, Haldwani, Rudrapur, Badshpur, Jaunpur, Varnasi, Basti, Nowgarh, Shoharatgarh, Berhani, Deoria, Ghazipur, Jangipur, Balrampur, Nawabganj, Gorkhpur, Sitapur, Allahabad, Bharwari, Barabanki, Fetehpur, Kishanpur, Khaga, Bindki, Faizabad, Hardor, Shahabad, Balamau, Madhoganj, Kanpur, Uttaripura, Pokhrayan, Rura, Lucknow, Unnao, Pratapgarh, Raebareli, Lalganj, Sultanpur, Agra, Achhnera, Firozabad, Aligarh, Hathras, Bareilly, Bijnor, Najibabad, Nagina, Dhanpur, Kiratpur, Budaun, Ujhani, Bulandshhr, Khurja, Gulwathi, Deba, Kasganj, Gandundwara, Eta, Etawah, Auraiya, Bhartanana, Jaswantnagar, Dibiapur, Farrukhabad, Kaimganj, Chhibdamau, Lakhimpur, Golagokarannth, Mainpuri, shikohabad, Mathura, Kosikalan, Meerut, Hapur, Ghaziabad, Baraut, Mawana, Sardhana, Moradabad, Chandausi, Sambal, Bahjoi, Amroha, Mandi Dhanaura, Muzaffarnagar, Shamli, Kandhla, Khatauli, Pilibhit, Bilaspur, Rampur, Saharanpur, Monglour, Deoband, Rampur-Maniharan, Roorkee, Shahjannpur, Tilhar, Bnda, Atrrah, karwai, Barwa-Suerpur, Maudaha, Mahoba, Cherkhari, Maurinipur, chirgao, Lalitpur, Orai, Konch, Kalpi, Jalaun, Mirzapur.

ORISSA	Anugal, Padampur, Bolangir, Khendupatta, Banki, Raipur, Kendrapara, Malkangiri, Baripada, Bahadajhola, Nimapara, Gunpur, Surgipalli.
BIHAR	Nawada, Gaya, Biharsiraff, Patna City, Muzzaffarpur, Bharatpur, Bittaha, Gulbag, Samastipur
JARKHAND	Gumla, Rachi, Lohargarh, Palamu, Singhbhum, Dhanbad, Bokaro, Hazaribag.

4.1.1 Arrivals :

The marketing year for groundnut is October to September with peak arrivals from October to March during this period, around 65 to 66 percent arrivals in the 524 markets were reported in the country during 1998-99 to 2000-01. It has been reported that, about 24 to 28 percent Groundnut arrives during April to June, whereas about 12 to 16 percent during July to September. During 1998-99 to 2000-01, it has been observed that among major producing states, maximum arrivals were in Karnataka (22.29 to 27.25 percent) followed by Andhra Pradesh (19.10 to 26.43 percent), Gujarat (14.91 to 21.26 percent), Tamil Nadu (12.95 to 16.20 percent) and Maharashtra (8.76 to 12.91 percent). These five states contributed about 89.75 to 91.69 percent of total arrivals. In Karnataka, major arrivals were in October to December and April to June quarter followed by January to March and minimum in July to September, whereas, in Andhra Pradesh, major arrivals were during January to March quarter followed by October to December and April to June and lowest in July to September quarter. In Gujarat, marketing season is spread mainly from October to June, but maximum arrival of groundnut takes place during October to December and April to June quarter and least during July to September. In the markets of Tamil Nadu, peak arrivals are during April to June and October to December. The Groundnut crop is received round the year in Tamil Nadu state. In Maharashtra, arrivals of Groundnut were higher during October to December followed by April to June and July to September, while lowest during January to March quarter. In other states, the movement of Groundnut crop was mainly concentrated during October to December only. The arrivals of 1998-99 to 2000-01 in major Groundnut producing states are given in Table No. 9.

Table No. 9 : Groundnut arrival from villages in selected regulated markets

(in thousand quintal)

STATE /MARKETS	MARKETI-NG YEAR	OCT DEC.	% Sha-re	JAN MAR.	% Sha-re	APRIL JUNE	% Sha-re	JULY SEPT.	% Sha-re	TOTAL	% Sha-Re to India
1	2	3		4		5		6		7	
ANDHRA PRADESH (47 Markets)	2000-2001	528.8	29.8	914.3	51.6	190.2	10.7	138.8	7.8	1772.1	26.4
	1999-2000	363.7	24.7	617.6	41.9	295	20.0	196.8	13.4	1473.1	19.1
	1998-1999	532.2	31.2	643.2	37.8	356.4	20.9	172	10.1	1703.8	20.0
GUJARAT (46 Markets)	2000-2001	550.7	38.6	286.7	20.1	409.5	28.7	178.3	12.5	1425.2	21.3
	1999-2000	596.6	36.3	304.5	18.5	516	31.4	226.8	13.8	1643.9	21.3
	1998-1999	325.2	25.6	285.3	22.4	401	31.5	259.6	20.4	1271.1	14.9
HARYANA (23 Markets)	2000-2001	4.7	100.0	0	0.0	0	0.0	0	0.0	4.7	0.1
	1999-2000	4.6	100.0	0	0.0	0	0.0	0	0.0	4.6	0.1
	1998-1999	3.4	100.0	0	0.0	0	0.0	0	0.0	3.4	0.0

KARNATAKA (48 Markets)	2000-2001	394.5	26.4	367.1	24.6	557.1	37.3	176	11.8	1494.7	22.3
	1999-2000	747.2	39.4	391.1	20.6	559.8	29.5	198.8	10.5	1896.9	24.6
	1998-1999	1010.7	43.5	477.4	20.6	559.9	24.1	274.3	11.8	2322.3	27.2
MADHYA PRADESH (37 Markets)	2000-2001	69.1	56.4	27.4	22.3	19.7	16.1	6.4	5.2	122.6	1.8
	1999-2000	65.1	46.2	31.4	22.3	35.7	25.3	8.8	6.2	141	1.8
	1998-1999	80.4	51.5	27.6	17.7	35.4	22.7	12.8	8.2	156.2	1.8
MAHARAS-HTRA (7 6 Markets)	2000-2001	199.7	34.0	34.5	5.9	167	28.4	186	31.7	587.2	8.8
	1999-2000	251.3	31.5	52.1	6.5	267.3	33.5	226.8	28.4	797.5	10.3
	1998-1999	288.4	26.2	96.1	8.7	410.2	37.3	305.4	27.8	1100.1	12.9
PUNJAB (38 Markets)	2000-2001	3.4	44.2	3.9	50.6	0	0.0	0.4	5.2	7.7	0.1
	1999-2000	3.7	66.1	1.9	33.9	0	0.0	0	0.0	5.6	0.1
	1998-1999	2.9	60.4	1.9	39.6	0	0.0	0	0.0	4.8	0.1
RAJASTHAN (28 Markets)	2000-2001	230.2	85.8	28.9	10.8	6.7	2.5	2.4	0.9	268.2	4.0
	1999-2000	358.9	80.2	64.9	14.5	13.2	3.0	10.3	2.3	447.3	5.8
	1998-1999	275.8	67.8	94.1	23.1	11.2	2.8	25.9	6.4	407	4.8
TAMILNADU (46 Markets)	2000-2001	255.4	29.4	182.6	21.0	277	31.9	153.4	17.7	868.4	13.0
	1999-2000	238.4	21.5	143	12.9	356.5	32.1	372.6	33.6	1110.5	14.4
	1998-1999	263.9	19.1	253.8	18.4	622.4	45.1	240.7	17.4	1380.8	16.2
UTTAR PRADESH (135 MarKets)	2000-2001	87.4	56.6	57.3	37.1	1.9	1.2	7.7	5.0	154.3	2.3
	1999-2000	138.5	72.0	49.9	25.9	1.6	0.8	2.4	1.2	192.4	2.5
	1998-1999	96.8	56.0	72	41.6	3.6	2.1	0.5	0.3	172.9	2.0
TOTAL (524 Markets)	**2000-2001**	**2323.9**	**34.7**	**1903**	**28.4**	**1629**	**24.3**	**849.4**	**12.7**	**6705.1**	100.0
	1999-2000	**2768**	**35.9**	**1656**	**21.5**	**2045**	**26.5**	**1243**	**16.1**	**7712.8**	100.0
	1998-1999	**2879.7**	**33.8**	**1951**	**22.9**	**2400**	**28.2**	**1291**	**15.2**	**8522.4**	100.0

SOURCE :- Quarterally Bulletin of Market Arrivals from Villages, April-Jun, 2002, Directorate of Economics and Statistics, Dept. of Agriculture & Co-operation, Ministry of Agriculture, Govt. of India.

4.1.2 Despatches :

Groundnut is mostly despatched to the markets with in the same state or to the markets of adjoining states. It has been noticed that in the states like Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu and Maharashtra, Groundnut was despatched to the markets at longer distances. The dispatches from Tamil Nadu, Maharashtra, Andhra Pradesh and Karnataka to other area are largely in the form of kernels. The despatches from Karnataka. Uttar Pradesh, Punjab and Rajasthan are mostly of pods. Arrivals in Maharashtra have been observed from Andhra Pradesh, Karnataka and Tamil Nadu. It has been observed that in Madhya Pradesh and Bihar, larger supplies from other states during the months of June to August were received.

4.2 Distribution :

Assembling and distribution system of marketing are closely related. The producer makes the movement of Groundnut from the farm to the assembling centers, while a number of market functionaries can be involved in the distribution dealing with its subsequent movement to the final consumer. The purchase of Groundnut for processing units is mainly done by the commission agents in all major assembling markets. As such, commission agents are the important distributing agency for Groundnut. In the assembling markets,

processing units also purchase and dispatch Groundnut to their own units. The distribution for retail sale in the non-producing states is mainly done by wholesalers. The Groundnut is distributed through different ways i.e. wholesale distribution, retail distribution, direct marketing to miller etc. The following agencies are engaged in the distribution of Groundnut at various stages of marketing.

- Producers
- Village traders
- Itinerant traders
- Retailers
- Wholesale merchants
- Commission agents
- Groundnut millers/processors
- Co-operative organisations
- Government organisations
- Exporters and importers

4.2.1 Inter-state movement :

Inter-state movement of groundnut takes place by rail, road and river. Andhra Pradesh, Tamil Nadu, Gujarat, Maharashtra, Karnataka, Madhya Pradesh and Rajasthan. together accounts for nearly 95 percent of total production of groundnuts in the country and this play major role in its inter-state movements. West Bengal, Bihar, Himachal Pradesh, Uttar Pradesh and Haryana are the main importing states, while Gujarat, Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu and Rajasthan are the major exporting states. The movement by rail between different states continues throughout the year but more than half the haulage by rail between different states is during the four winter months i.e. November to February.

4.3 Export and import :

Export:

India export both type of Groundnut i.e. Groundnuts in shell and shelled Groundnut. India has been a traditional exporter of HPS (Hand Picked Selected Groundnut). It has been observed that India exports four types of Groundnuts. The value of exports of these four categories during 2001-02 to 2003-04 is given in Table No. 10.

Table No.10 : The value of exports of four categories Groundnut during 2001-02 to 2003-04

Values in Rs. Lacs

Types	Commodity Description	Year		
		2001-2002	2002-2003	2003-2004
1	Groundnuts in shell, H.P.S.	9,379.28	5,386.39	
2	Groundnuts in shell, N.E.S.	266.98	385.84	
	Sub total of Groundnuts in shell	**9,646.26**	**5,772.23**	**11,039.43**
3	Shelled Groundnuts kernel, H.P.S	14,079.66	11,062.26	
4	Shelled Groundnuts kernel, N.E.S	1,367.95	995.68	
	Sub total Shelled Groundnuts	**15,447.61**	**12,057.94**	**43,391.02**
	Total of Groundnuts	**25,093.87**	**17,830.17**	**54,430.45**

SOURCE : www.commerce.nic.in

Indonesia, Malaysia, United Kingdom, Ukraine, United States of America, Philippines, Netherland, Singapore, and Srilanka are major Groundnut importing countries. India's total Exports of Groundnut were 176109.33 thousand kg. in 2003-04 valued at Rs. 54,430.45 lakhs. The share of Groundnuts in shell was 39779.84 thousand kg. valued at Rs. 11,039.43 lakhs. The country-wise export of Groundnuts in shell and shelled Groundnuts during 2002-03 and 2003-04 is given in Table No.11.

Table No.11 : The country wise export of Groundnuts in shell and shelled Groundnuts during 2002-03 and 2003-04

Values in Rs. Lacks Quantity in thousands Kg

Country	Groundnuts in shell				Shelled Groundnuts			
	2002-2003		2003-2004		2002-2003		2003-2004	
	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity
1.Indonesia	3,092.25	11,911.70	4,167.60	15,084.63	6,779.16	24,648.25	12,141.87	43,662.77
2.Malaysia	1,974.82	7,439.19	3,042.28	10,919.90	2,267.02	8,419.37	7,076.19	25,422.63
3.Netherlands	19.39	66.04	74.56	262.5	20.39	66.54	2,283.22	5,125.85
4.Philippines	82.22	337.24	632.84	2,148.70	294.15	982.48	3,401.92	11,573.56
5.Singapore	188.2	734.31	433.67	1,564.72	497.27	1,826.88	1,097.94	3,796.57
6.Sri Lanka	80.17	338.6	28.96	147	715.86	3,543.33	190.3	1,081.97
7.U k	22.62	74.01	1,324.91	4,937.00	504.71	1,779.45	1,959.58	6,976.34
8.Ukraine	21.01	72	253.88	862	320.97	1,083.52	457.29	1,500.50
9.USA	2.27	18.01	96.52	312.29	30.53	84.6	8,869.03	18,370.65
10.Others	289.28	2,483.54	984.21	3,541.10	627.88	1,980.69	5,913.68	18,818.65
Total	**5,772.23**	**23,474.64**	**11,039.43**	**39,779.84**	**12,057.94**	**44,415.11**	**43,391.02**	**1,36,329.49**
Total Groundnut export: Values Rs. 54430.45 Lacks and Quantity 176109.33 thousand Kg								

SOURCE : www.commerce.nic.in

Import:

India is not a major Groundnut importing country. During 2001-02 and 2002-03, country imported meager quantity of shelled Groundnut kernels, HPS from Norway and Japan respectively. The details are as under:

Table No.12 : Import of shelled Groundnut kernel, H.P.S. during 2001-02 and 2002-03

(Value in Rs. Lacks; quantity in thousands Kg.)

Sl. No.	Country	2001-02		2002-03	
		Value	Quantity	Value	Quantity
1.	Norway	3.81	1.00	---	---
2.	Japan	---	---	5.63	18.00
Total		3.81	1.00	5.63	18.00

SOURCE : www.commerce.nic.in

4.3.1 Sanitary and phyto-sanitary measures:

The Sanitary and phytosanitary (SPS) measures are a n integral part of export trade as per agreement made under GATT (General Agreement on Trade and Tariffs), 1994. As per provisions made under this agreement, the standards framed should be such that the minimum level of protection required by an importing country may be fulfilled. In order to achieve this objective, the agreement to set up international standards and guidelines under the aegis of Codex Alimentaris Commission (Codex), which was earlier set up in 1963 by the Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) to develop food standards, by laying down guidelines and related texts such as Codex of tactics under the joint aegies of FAO/WHO, Food standard programme are aimed at protecting health of the consumers and ensuring fair trade practices in the food trade as well as to promote co-ordination of all food standards work undertaken by international governmental and non-governmental organisation.

The SPS agreement applies to all Sanitary and Phyto-sanitary measures, which may directly or indirectly, affect international trade. Sanitary measures deal with human or animal health, and Phyto-Sanitary measures are related to plant health. SPS measures are applied in four situations for the protection of human, animal or plant health :

- ☛ Risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease causing organisms.
- ☛ Risks coming from additives, contaminants, toning or disease-causing organisms in foods, beverages or feed stuffs.
- ☛ Risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment, or spread of pests.
- ☛ Prevention or limitation of damage caused by the entry, establishment or spread of pests.

The SPS standards commonly applied by Governments, which affect imports are:

i) **Import ban** (Total/partial) is generally applied when there is a significant rate of risk about a hazard.
ii) **Technical specifications** (Process standards/Technical standards) are most widely applied measures and permit import subject to compliance with pre-determined specifications.
iii) **Information requirements** (Labeling requirements/Control on voluntary claims) permit imports provided they are appropriately labelled.

Procedure for issue of SPS certificate for export:

In order to make plant materials free from quarantine and other injurious pests to conform with the prevailing phyto-sanitary regulations of the importing country, the exporter needs to give a suitable disinfestation / disinfection treatment, without affecting the viability for sowing / edibility of the plants/seeds.

For plant materials (seed, meal, extraction, etc.) meant for export, Government of India, has authorised some Private Pest Control Operators (PCO), who have the expertise, men and materials for treating the export agricultural cargo / produce. The exporter has to apply to the officer-In-charge (Plant Protection and Quarantine Authority, Department of Agriculture and Cooperation) for Phyto-Sanitary Certificate (PSC) in prescribed application

form at least 7 to 10 days in advance of the export. Before submitting the application for issue of PSC, it should be ensured that the cargo is treated properly by the licensed PCO's.

According to schedule – II (Clause 4) the following condition is also essential for import of Groundnut plant, seed for sowing and consumption purposes.

Conditions, for import of plants, seeds for sowing, planting and consumption

Plants, Seeds and propagating materials	Countries from where import is prohibited	Pest for which additional declarations in Official Phytosanitary Certificate are required	Special Conditions for import
Groundnut Seeds Peanut (all species of Arachis)	---	i) Production of seeds in areas free of Puccinia arachidis and Sphaceloma arachidis. ii) Inspection of parent crops in active growing season and certification for freedom from peanut mottle, peanut Stunt & marginal chlorosis viruses.	i) Consignments can only be imported as decorticated seeds. ii) Consignments can only be imported for research work. iii) Consignments originating from North and South America shall be grown in intermediated post entry quarantine facility in non groundnut growing countries and healthy seedlings or cuttings shall only be imported.

Source : SEA Millennium Handbook on Indian Vegetable Oil Industry and Trade by The Solvent Extractors' Association of India, Mumbai

4.3.2 EXPORT PROCEDURE:

The exporter should keep in mind about the following laid down procedures while export of Groundnuts:

- Importer-Exporter Code (IEC) number to be obtained from Director General of Foreign Trade (DGFT).
- Register with the concerned Export Council/Authority e.g. Agricultural & Processed Food Export Development Authority (APEDA) to obtain registration cum membership certificate and it is also required to obtain permissible benefit from government.
- Quality of product is to assess by any inspecting agency to obtain the certificate.

For Groundnut in Shell and kernels:

A. For European Countries, the procedure is given below:

- Membership of Indian Oilseeds & Produce Exporters Association (IOPEA) is compulsory.
- Quality Certificate from the SGS India Laboratory, GEO-CHEM Laboratory etc.
- Registration Certificate of IOPEA and APEDA for passing the shipping bills.

B. Except European Countries:

- Export under open general licence i.e. No. Restrictions/No License
- If buyers wants quality certificate from India, exporter will obtained from the said laboratory.

4.4 Marketing constraints :

- **Processing** : There is a need of improved technologies for Groundnut processing. At present, age-old techniques were used in processing, which reduces the out put.
- **Improved Technology** : Producers were not using improved Technologies in producing Groundnut right from the selection of improved high yielding seeds to use of improved equipments and post-harvest operational techniques.
- **Aflatoxin** : Groundnut is vulnerable to attack by *Aspergillus flavus* fungus, which produces Aflatoxin. An Aflatoxin level up to certain limit is acceptable but beyond that the produce is not suitable for consumption.
- **Marketing information** : Due to lack of market information regarding prevailing prices, arrivals etc., most of the producers market the Groundnut in the village itself, which deprives them of getting remunerative returns.
- **Adoption of grading** : Grading of Groundnut at producers' level ensures better prices to producers and better quality to consumers. However, most of the markets are lagging behind in providing grading service at producers' level.
- **Inadequate storage facilities** : To avoid the distress sale, storage facilities in villages are found to be inadequate. Due to lack of storage facilities at rural stage, substantial quantity is lost.
- **Transportation facilities** : Due to inadequate facilities of transportation at village level, in most of the states, producers are forced to sell Groundnut in the village itself to itinerant merchants or traders directly at low prices.
- **Training of producer** : The farmers are not trained in marketing system. Training shall improve their skill for better marketing of their produce.
- **Malpractices** : Many malpractices prevail in the markets of Groundnut i.e. excess weighment, delay in payment, high commission charges, delay in weighing and auction, different kinds of arbitrary deductions for religious and charitable purposes etc.
- **Financial problem** : Lack of market finance is one of the major marketing problems in the smooth running of marketing chain.
- **Infra-structure facilities** : Due to inadequate marketing infra-structural facilities with producers, traders, millers and at market level, the marketing efficiency is affected adversely.
- **Superfluous middlemen** : The existence of a long chain of middlemen reduces the producer's share in consumer's rupee.

5.0 MARKETING CHANNELS, COSTS AND MARGINS

5.1 Marketing channels :

Private: The following are the important marketing channels existing in the marketing of Groundnut

1. Producer - Merchant – Commission Agent- Wholesaler – Oil Miller
2. Producer – Merchant – Commission Agent – Oil Miller – Wholesaler – Retailer – Consumer
3. Producer – Oil Miller – Wholesaler – Retailer – Consumer
4. Producer – Merchant – Commission Agent – Oil Miller – Retailer – Consumer
5. Producer – Merchant – Commission Agent – Oil Miller – Wholesaler – Retailer(for Kernels)

Common Institutional Channels:

Groundnut is also purchased by the public and co-operative sector agencies. It plays a very significant role in the procurement and distribution of Groundnut. National Agricultural Co-operative Marketing Federation of India Limited (NAFED) is the nodal agency for procurement of Groundnut. The main institutional marketing channel for Groundnut is as under;

1. Producer- Village Co-operative Society – Processing Units of Co-operatives, State Co-operative Federation – Co-operative Retail Stores – consumers.
2. State Co-operative Marketing - Oil Miller (Private/Co-operative) - Co-operative Retail Store/ Fair Price Shop - Consumer.
3. Producer – Village Co-operative Society – Oil Miller – Oil Wholesaler – Retailer – Consumer.
4. Producer - NDDB - NDDB Processing Unit – Retailer – Consumer.

❒ **Criteria for selection of channel:** Selection of channel by buyer and seller both depends on efficiency of the channel, which is judged on the basis of efficiency in providing services at minimum cost and time in completing the transaction. NDDB has purchase either directly from the farmer or through farmers' co-operative, which may have branches at village level. No purchase is done through traders or other intermediaries. There are many marketing channels involved in marketing of Groundnut. The following are the criteria for the selection of efficient marketing channels.

- The channel, which ensures reasonable return to producer, is considered to be good or efficient.
- Transportation cost in that channel.
- Commission charges and market margins received by the intermediaries, such as trader, commission agent, wholesaler and retailer.
- Financial resources with producer.

5.2 Marketing Costs and margins:

Marketing costs :

Marketing costs are the actual expenses incurred in bringing goods and services from the producer to the consumers. The marketing costs normally include;

a. handling charges at local points
b. assembling charges
c. transport and storage costs
d. handling charges by wholesaler and retailer
e. expenses on secondary services like financing, risk taking and market intelligence, and
f. profit margins taken by different agencies.

Marketing margins :

Margin refers to the difference between the price paid and received by a specific marketing agency such as a single retailer, or by any type of marketing agency, i.e. retailers or wholesalers or by any combination of marketing agencies in the marketing system as a whole. Total marketing margin includes cost involved in moving the Groundnut from producer to consumer and profits of various market functionaries.

Total marketing margin	**=**	**Cost involved in moving the Groundnut from producer to consumer**	**+**	**Profits of various market functionaries**

The study of marketing costs and margins as well as producer's share in consumer's price are basically intended to assess comparative efficiency of different marketing channels and to identify the scope for improvement in the various marketing functions so that the producers and consumers get remunerative and fair prices respectively.

A study carried out by Directorate of Marketing and Inspection (DMI) and published in their report on "Marketing of Groundnut in India" on the marketing costs, margins and price spread for Groundnut, it was revealed that the producers' share in consumer rupee was on an average 71.56 percent, marketing costs 16.21 percent and marketing margins on an average 12.23 percent. The three marketing channels studied were;

Channel-I : Producer—Miller— wholesaler—retailer—consumer
(Through C.A.)

Channel-II: Producer--Village Merchant—wholesaler--- wholesaler---retailer—consumer
(Assembling market) (Consuming market)

Channel-III: Producer—— wholesaler—retailer—consumer

The details of costs and margins are furnished in the Table No. 13 and Table No.14

Table No13 : Marketing Costs, Margins & Price spread of Groundnut in different States

Percentage

Particulars	Andhra Pradesh	Bihar	Delhi	Karna-taka	Maha-rashtra	Tamil Nadu	West Bengal	Aver-age
A. Producer's Share in consumers rupee	**79.40**	**59.15**	**73.47**	**73.39**	**66.48**	**76.48**	**72.55**	**71.56**
B. Marketing Costs	**13.23**	**20.42**	**15.24**	**13.58**	**23.94**	**10.95**	**16.11**	**16.21**
C. Marketing Margins	**7.37**	**20.43**	**11.29**	**13.09**	**9.58**	**12.57**	**11.34**	**12.23**
D. Consumers price	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source : Marketing of Groundnut in India, 2000, Directorate of Marketing & Inspection, Branch head office, Nagpur, MRPC Report No. 26

Table No.14 : Marketing costs, margins and price spread of Groundnut In different channels

(Rs. /Qtl)

Particulars	Channel – I Amount (Rs.)	Channel – II Amount (Rs.)	Channels – III Amount (Rs.)	Average
A. Producers share in consumer rupee	1283.60 (79.04)	1035.13 (59.15)	866.56 (76.48)	1075.08 (71.56)
B. Marketing costs	280.46 (17.27)	357.35 (20.42)	124.07 (10.95)	243.53 (16.21)
C. Marketing margins	59.93 (03.69)	357.52 (20.43)	142.43 (12.57)	183.74 (12.23)
D. Consumers price	1623.99 (100)	1750.00 (100)	1133.06 (100)	1502.35 (100)
Marketing Efficiency Ranking	3.77 I	1.45 III	3.25 II	

Source : Marketing of Groundnut in India, 2000, Directorate of Marketing & Inspection, Branch head office, Nagpur, MRPC Report No. 26.

From the above case study of price spread of Groundnut, it is evident that the Channel-I is the most efficient channel among three channel, Andhra Pradesh Producer's received higher share in consumer's rupee followed by Tamil Nadu.

6.0 MARKETING INFORMATION AND EXTENSION

Marketing information :

Marketing Information is essential for producers in planning production and market led production. It is equally important for other market participants for trading. Recently, Govt. of India has launched Agricultural Marketing Research and Information Network Scheme through Directorate of Marketing & Information (DMI) to bring out improvement in the present market information scenario by linking all Agricultural produce wholesale markets in the States and Union Territories in a phased manner. The data received from markets is being displayed on the website **www.agmarknet.nic.in**.

Marketing extension :

Market extension is a vital service for enlightening the farmers about timely marketing and improving their awareness in various aspects of post harvest measures for efficient and cost effective marketing.

Benefits : It;

- Provides the up-to-date information on the arrivals and prices of agricultural commodities in different markets.
- Guides the producers to take right decision, when, where and how much to market their produce.
- Educates the producers/traders about the post harvest management i.e.
  a. Harvesting care
  b. Techniques to minimise losses during post harvest period.
  c. Value addition to the produce by proper cleaning, processing, packaging, storage and transportation.
- Orients the producers/traders about prevailing price trends, demand and supply situation etc.
- Orients the producer regarding the importance of grading, co-operative/group marketing, direct marketing, contract farming, futures trading etc.
- Provides the information about the sources of credit availability, various Govt. schemes, policies, rules and regulations etc.

Sources :

The following are the sources of marketing information available in the country.

Source / Institution	Activities for marketing information and extension
Directorate of Marketing and Inspection (DMI), NH-IV, CGO Complex, Faridabad. **Website: www.agmarknet.nic.in**	➢ Provides information through nationwide Marketing Information Network (**"AGMARKNET"** portal). ➢ Marketing extension through training to educate producers, graders, consumers etc. ➢ Marketing research survey. ➢ Publication of reports, pamphlets, leaflets, Agricultural Marketing journal, Agmark standards etc.
Central Warehousing Corporation (CWC), 4/1 Siri Institutional Area Opp. Siri fort New Delhi-110016 Website : www.fieo.com/cwc/	➢ Farmers Extension Service Scheme (FESS) was launched by CWC in the year 1978-79 with the following objectives : i) To educate farmers about the benefit of scientific storage and use of public warehouses. ii) To impart training to the farmers on the techniques of scientific storage and preservation of foodgrains. iii) To assist farmers in getting loans from the banks against pledge of warehouse receipt. iv) To demonstrate spraying and fumigation methods to control insects.
Director General of Commercial Intelligence & Statistics (DGCIS),	➢ ➢ Collection, compilation and dissemination of marketing related data i.e. export-import data, inter-state movement of

1, Council House Street Kolkata -1	foodgrains etc.
Directorate of Economics and Statistics, Shastri Bhavan,New Delhi Website: www.agricoop.nic.in	➢ ➢ Compilation of agricultural data for development and planning. ➢ Dissemination of market intelligence through publication and internet.
Agriculture Produce Marketing Committee (APMC)	➢ Provides market information on arrivals, prevailing prices, despatches etc ➢ Provides market information of adjoining / other market committees. ➢ Arranges farmers training, tours, exhibitions etc.
Federation of Indian Export Organisations (FIEO), PHQ House(3rd Floor) Opp. Asian Games , New Delhi-110016	➢ Provides information to its members about latest developments in export and import. ➢ Organises seminars, workshops, presentation, tours, buyer-seller meets, sponsoring participation in international trade fair, exhibitions and providing advisory services with specialized divisions. ➢ Provides useful information on India's export and import with diverse database.
State Agricultural Marketing Boards, At different State capital	➢ ➢ Provides marketing related information to co-ordinate all the market committees in the state. ➢ Arrange training, seminars, workshops and exhibitions on subjects related to agricultural marketing. ➢ Undertakes developmental work relating to construction of agricultural produce markets with infra-structural facilities.
Kisan Call Centers (New Delhi, Mumbai, Chennai, Kolkata, Hyderabad, Banglore, Chandigarh and Luknow)	➢ ➢ Provides expert advise to the farmers. ➢ These centers will operate through toll free telecom lines throughout the country. ➢ A country wide common four digit number 1551 has been allocated to these centers.
Mass Media Support to Agriculture Extension	➢ Mass media support to agriculture extension has been augmented with three new initiatives. i) The first component establishes a cable satellite channel for national broadcast using the existing facilities available with Inira Gandhi National Open University (IGNOU). ii) The second component is use of low and high power transmitters of Doordarshan for providing areas specific telecast. Initially, 12 locations were chosen to launch broadcasting, namely Jalpaiguri (West Bengal), Indore (Madhya Pradesh), Sambhalpur (Orissa), Shillong (Meghalaya), Hissar (Haryana), Muzzafarpur (Bihar),

	Dibrugarh (Assam), Varanasi (Uttar Pradesh), Vijaywada (Andhra Pradesh), Gulbarga (Karnataka), Rajkot (Gujarat), Daltonganj (Jharkhand). iii) The third component of the mass media is use of FM transmitter network of All India Radio (AIR) to provide area specific broadcasting through 96 FM stations.
Agriculture-Clinics and Agri-Business by Agriculture Graduates	➢ A central sector scheme "Establishment of Agriculture-Clinics and Agri-business managed by Agriculture graduates" is being implemented since 2001-02. ➢ The aim is to provide opportunity to all eligible agriculture graduates, to support agricultural development through economically viable ventures. ➢ The scheme is being jointly implemented by NABARD, National Institute of Agricultural Extension Management (MANAGE) and Small Farmers' Agri-business Consortium (SFAC) in association with about 66 reputed training institutes in the country.
Different websites on Agricultural Marketing Information	www.agmaknet.nic.in www.agricoop.nic.in www.fieo.com/cwc/ www.ncdc.nic.in www.nic.in/eximpol www.fmc.gov.in www.nmce.com www.icar.org.in www.fao.org www.agrisurf.com www.agriculturalinformation.com www.agriwatch.com www.kisan.net www.agnic.org www.isapindia.org www.indiaagronet.com www.commodityindia.com

❒ Kisan Call Centre  :

The Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, Government of India launched Kisan Call Centres on January 21st,2004 throughout the

country. It has the objective of affording instant solution to the problems faced by the farmers during crop cultivation under diverse challenging situations and facilitating their full comprehension by the use of local language. The call centres are acting as composite help centres, which consist of a complex tele-communication infrastructure, computer support and human resources organized to manage effectively and efficiently the queries raised by farmers instantly in local languages. The subject matter specialists using telephone and computer are used to interact with farmers to understand their problems and answer their queries as soon as possible. This is a new dimension in agricultural extension management, which makes the full use of on-going information and communication revolution by connecting the farming community in the remotest areas of the country with the experts in agricultural field. In between 02-07-2003 and 20-05-2005, 55,245 calls were answered by Kisan Call Centre in India with aggregate average 2511 calls per month (approximately) and overall average 84 calls per day.

7.0 ALTERNATIVE SYSTEMS OF MARKETING

7.1 Direct marketing :

Direct marketing is an innovative concept, which involves marketing of produce. Direct marketing enables producers and millers and other bulk buyers to economise on transportation cost and improve price realization. It also provides incentive to large scale marketing companies i.e. millers and exporters to purchase directly from producing areas. Direct marketing by farmers to the consumers has been experimented in the country through *Apni Mandis* in Punjab and Haryana. The concept with certain improvements has been popularised in Andhra Pradesh through *Rythu Bazars.* At present, these markets are being run at the expense of the state exchequer, as a promotional measure, to encourage marketing by small and marginal producers without the involvement of the middlemen. In these markets, many commodities are marketed along with fruits and vegetables.

Benefits :

- Direct marketing helps in better marketing of Groundnut.
- It increases profit of the producer.
- It minimises marketing cost.
- It encourages distributional efficiency.
- It satisfies the consumer through supply of better quality of produce at reasonable price.
- It provides better marketing techniques to producers.
- It encourages direct contact between producers and consumer.
- It encourages the farmers for retail sale of their produce.

7.2 Contract farming :

"Contract farming" is a system of marketing in which the commodity is marketed by farmers under a pre-agreed buy-back contract with an agency engaged in trading or processing. In contract farming, a producer produces and delivers to the contractor, a

quantum of required stipulated quality of produce, based upon anticipated yield and contracted acreage, at a mutually pre-agreed price. In this agreement, agency contributes input supply and renders technical guidance. The company also bears the entire cost of transaction and marketing. By entering in to contract, farmer's risk of price reduces and the agency reduces the risk of non-availability of raw material. The inputs and extension services provided by the agency include supply of improved seed, credit, fertilizers, pesticides, farm machinery, technical guidance, extension, procurement of produce, etc.

Punjab State is the leading state in the contract farming in India. The Punjab Agri-business Farm Corporation provides all technical and financial facilities to the farmers. PepsiCo India Ltd. Is a contracting agency for Groundnut cultivation in Punjab, whereas Mahindra Sulabh Services Ltd. Is contracting agency in Uttar Pradesh.

Benefits :

Contract farming is beneficial to both producer as well as to contracting agency. These benefits are summed up below:

Benefits	To Producer	To Contracting agency
Risk	It minimises the price risk.	It minimises risk of raw material supply.
Price	Price stability ensuring fair price.	Price stability as per pre-agreed contract.
Quality	Use of quality seed and inputs.	Get good quality produce.
Payment	Assured and regular payments through bank tie up.	Easy handling and better control on payment.
Post-harvest handling	Minimises risk and cost of handling.	Efficient handling of produce.
New technology	Facilitates farm management practices.	Meets consumer needs at reasonable price and assured quality.
Fair trade practices	Minimises malpractices.	Better control on trade practices.
Crop insurance	Reduces risk.	Reduces risk.
Mutual relationship	Strengthens.	Strengthens.
Profit	Increases.	Increases.

7.3 Co-operative marketing:

"Co-operative marketing" is the system of marketing in which a group of producers join together and register them under respective State Co-operative Societies Act to market their produce jointly. The members also deal in a number of co-operative marketing activities i.e. purchasing of produce, grading, packing, , processing, storage, transport, finance, etc. The

co-operative marketing means selling of the member's produce directly in the market, which fetches remunerative prices. It helps the member to produce better quality of Groundnut, which has good demand in the market. It also provides fair trade practices and protect against manipulations / malpractices. The main objectives of co-operative marketing are to ensure remunerative prices to the producers, reduction in the cost of marketing, and monopoly of traders. The co-operative marketing structure in the different states consists of;

1. **Primary Marketing Society** (PMS) at the Mandi level
2. **State Co-operative Marketing Federation** (SCMF) at the State level
3. **National Agricultural Co-operative Marketing Federation of India Ltd.** (NAFED) is at the National Level.

National Co-operative Development Corporation (NCDC) and State Governments are providing financial assistance and other facilities for development of Co-operative Marketing Societies.

National Agricultural Co-operative Marketing Federation of India Ltd. (NAFED): The Government of India has entrusted NAFED with the support price purchase operations of Groundnut since 1976-77. Besides internal trade of Groundnut and its products, NAFED also exports HPS Groundnut since 1978-79.

National Dairy Development Board (NDDB): The National Dairy Development Board (NDDB) is implementing an integrated oilseed and vegetable oil production, procurement, processing and marketing project through a two-tier co-operative structure. A separate net work of village level oilseed grower's co-operative societies and state level federations have been promoted by NDDB for implementing the project.

Procurement : Procurement operations under this project provide an assured remunerative price and convenient market for farmers to support production.

Processing : Under the project, apart from old ones, new modern and efficient oilseed processing plants are also constructed to provide better returns to the oilseed grower members.

Marketing : National Dairy Development Board supplies edible oils received as donation from abroad through the participation of state federations.

Benefits :

- Remunerative price to producers.
- Reduction in cost of marketing.
- Reduction in commission charges.
- Effective use of infra-structure.
- Credit facilities.
- Collective processing.
- Easy transportation.
- Reduces malpractices.
- Supply of agricultural inputs.
- Marketing information.

7.4 Forward and futures markets :

Forward trading means an agreement or a contract between seller and purchaser, for a certain kind and quantity of a commodity for making delivery at a specified future time, at contracted price. It is a type of trading, which provides protection against the price fluctuations of agricultural produce. Producers, traders and millers utilize the future contracts to transfer the price risk. Presently, future markets in the country are regulated

under the functioning of the Forward Contracts (Regulation) Act, 1952 (FMC). The Forward Markets Commission (FMC) performs the functions of advisory, monitoring, supervisions and regulations functions. Forward trading transactions are performed through exchanges owned by the Associations registered under the Act. These exchanges operate independently under the guidelines issued by the FMC.

After the recent decision during February 2003 of the Cabinet Committee on Economic Affairs (CCEA), Government of India, future trading has been allowed for 148 commodities including Groundnut, under section 15 of the Forward Contracts (Regulation) Act of 1952. Earlier, Groundnut was not allowed for future trading. Only Groundnut oil and oilcake were allowed only through the Bombay Commodity Exchange Ltd. Mumbai.

Forward contracts are broadly of two types. i.e. (a) Specific delivery contracts; and (b) Other than specific delivery contracts.

Benefits :

Futures contracts perform two important functions i) Price discovery and ii) Price risk management. It is useful to all segments of economy.

Producers	**:**	It is useful for producers because they can get idea of price likely to prevail at a future point of time and, therefore facilitate the planning of production.
Traders/Exporters	**:**	The future trading is very useful to the traders/exporters as it provides an advance indication of the price likely to prevail. This helps the traders/exporters in quoting a realistic price and, thereby, secure trading/export contract in a competitive market.
Millers/Consumers	**:**	Futures trading enable the millers/consumers to get an idea of the price at which the commodity would be available at a future point of time.
Other benefits	**:**	
1) Price stabilization	**:**	In times of violent fluctuations, futures trading reduce the price variations.
2) Competition	**:**	Futures trading encourages competition and provides competitive price to farmers, millers or traders.
3)Supply and demand	**:**	It ensures a balance in demand and supply position throughout the year.
4) Integration of price	**:**	Futures trading promotes an integrated price structure throughout the country.

8.0 INSTITUTIONAL FACILITIES

8.1 Marketing related schemes of government and public sector :

Name of the scheme/implementing organisation	Facilities provided/salient features/objectives

1.Agricultural Marketing Information Network Directorate of Marketing and Inspection, Head Office, N.H.-IV, Faridabad.	➢ To establish a nationwide information network for speedy collection and dissemination of market data for its efficient and timely utilization. ➢ To ensure flow of regular and reliable data to the producers, traders and consumers to derive maximum advantage out of their sales and purchases. ➢ To increase efficiency in marketing by effective improvement in the existing market information system. ➢ The scheme provides connectivity to 710 nodes comprising the State Agricultural Marketing Department (SAMD) /Boards/ Markets. These concerned nodes have been provided with one computer and its peripherals. The SAMD/Boards/ Markets collect desired market information and pass on to respective state authorities and Head Office of the DMI for forward dissemination. The eligible markets will get 100 percent grant by Ministry of Agriculture. National Agriculture Policy has proposed for coverage of another 2000 nodes during the Tenth Plan.
2. Gramin Bhandaran Yojana (Rural Godowns Scheme) Directorate of Marketing and Inspection, Head Office, N.H.-IV, Faridabad	➢ It is a capital investment subsidy scheme for construction/renovation/expansion of rural godowns. The scheme is implemented by DMI in collaboration with NABARD and NCDC. The objectives of the scheme are to create scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, consumer articles and agricultural inputs. ➢ To prevent distress sale immediately after harvest. ➢ To promote grading and quality control of agricultural produce to improve their marketability. ➢ To promote pledge financing and marketing credit to strengthen agricultural marketing in the country for the introduction of a national system of warehouse receipt in respect of agricultural commodities stored in such godowns. ➢ The entrepreneur will be free to construct godown at any place and of any size except for restrictions that it would be outside the limits of Municipal Corporation area and be of a minimum capacity of 100 MT. ➢ The scheme provides credit linked back-ended capital investment subsidy @25 percent of the project cost with a ceiling of Rs. 37.50 lakh per project. For the projects in North-Eastern states and hilly areas with altitude of more than 1000 m above mean sea level and SC/ST entrepreneurs, maximum subsidy admissible is @ 33 percent of the project cost, with a ceiling of Rs. 50.00 lakh.

3.Marketing Infra-structure & Agri-cultural Marketing Reforms Directorate of Marketing and Inspection, Head Office, N.H.-IV, Faridabad.	➢ To provide additional agricultural marketing infra-structure to cope up with the expected marketable surpluses of agricultural and allied commodities including dairy, poultry, fishery, livestock and minor forest produce. ➢ To promote competitive alternative agricultural marketing infrastructure by inducement of private and cooperative sector investments that sustain incentives for quality and enhanced productivity thereby improving farmers' income. ➢ To strengthen existing agricultural marketing infra-structure to enhance efficiency. ➢ To promote direct marketing so as to increase market efficiency through reduction in intermediaries and handling channels thus enhancing farmers' income. ➢ To provide infra-structure facilities for grading, standardization and quality certification of agricultural produce so as to ensure price to the farmers commensurate with the quality of the produce. ➢ To promote grading, and quality certification system for giving a major thrust for promotion of pledge financing and marketing credit, introduction of negotiable warehousing receipt system and promotion of forward and future markets so as to stabilize market system and increase farmers' income. ➢ To promote direct integration of processing units with producers. ➢ To create general awareness and provide education and training to farmers, entrepreneurs and market functionaries on agricultural marketing including grading, and quality certification.
4.Agmark Grading and Standardisation Directorate of Marketing and Inspection, Head Office, N.H.-IV, Faridabad.	➢ Promotion of grading of agricultural and allied commodities under Agricultural Produce (Grading & Marking) Act.1937. ➢ Agmark specifications for agricultural commodities have been framed, based on their intrinsic quality. Food safety factors are being incorporated in the standards to compete in world trade. Standards are being harmonised with international standards keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of consumers.
5.Co-operative Marketing, Processing, Storage etc. Programmes in Comparatively under / least developed states. National Co-operative Development Corporation, Hauz Khas, New Delhi	➢ To correct regional imbalances and to provide needed momentum to the pace of development of various programmes of co-operative agricultural marketing, processing, storage etc. in under/least developed states/UTs by providing financial assistance on liberal terms to augment the income of farmers and weaker sections of the community. ➢ The scheme provides for distribution of agricultural inputs, development of agro-processing including storage, marketing of foodgrains and plantation/horticultural crops, development of weaker and tribal sections, co-operatives, in dairy, poultry and fisheries.

6.Price Support Scheme (PSS), Food Corporation of India, Barakhamba Lane, Cannaught Place, New Delhi-110001	➢ Provides regular marketing support to the farmers to sustain and improve the production of Groundnut through price support operations. ➢ Maintains buffer stock for stabilization of true and distribution through fair price shops at subsidised prices.

8.2 Institutional credit facilities :

Institutional credit is the vital factor in agricultural development. The National Agriculture Policy targeted annual growth rate of 4 percent over the 10th plan period. During 1999-2000, the total institutional credit for agriculture was 46,268 crore against Rs. 86,981 crore during the year 2003-04. The main emphasis was laid down on adequate and timely credit support to the farmers, particularly small and marginal farmers for adoption of modern technology and improved agricultural practices.

The institutional Agriculture credit disbursed through co-operatives was 31 percent, 60 percent by Commercial Banks and 9 percent by Regional Rural Banks during 2003-2004. The institutional credit to Agriculture is offered in the form of short term, medium term and long term credit facilities:

Short term and medium term loans:

Name of scheme	Eligibility	Objective/Facilities
1. Crop Loan	All categories of farmers.	➢ To meet cultivation expenses for various crops through short-term loans. ➢ This loan is extended in the form of direct finance to farmers with a repayment period not exceeding 18 months.
2.Produce Marketing Loan	All categories of farmers.	➢ This loan is given to help farmers to store produce on their own to avoid distress sale. ➢ This loan also facilitates immediate renewal of crop loans for next crop. ➢ The repayment period of the loan does not exceed 6 months.
3. Kisan Credit Card Scheme (KCCS)	All agriculture clients having good track record for the last two years.	➢ This card provides running account facilities to farmers to meet their production credit and contingency needs. ➢ The scheme follows simplified procedures to enable the farmers to avail the crop loans as and when they need. ➢ Minimum credit limit is Rs. 3000/-. Credit limit is based on operational land holding, cropping pattern and scale of finance. ➢ Withdrawals can be made by using easy and convenient withdrawal slips. The Kisan Credit Card is valid for 3 years subject to annual review. ➢ It also covers personal insurance against death or permanent disability for maximum amount of Rs. 50,000 and Rs. 25,000 respectively.

4. National Agricult-ural Insurance Scheme (NAIS)	Scheme is available to all farmers – loanee and non-loanee both- irrespective of the size of their holding.	➢ To provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities, pests and diseases attack. ➢ To encourage the farmers to adopt progressive farming practices, high value in-puts and high technology in agriculture. ➢ To stabilize farm incomes, particularly in disaster years. ➢ General Insurance Corporation of India (GIC) is the Implementing Agency. ➢ Sum insured may extend to the value of threshold yield of the area insured. ➢ Covers all food crops (cereals, millets and pulses), oilseeds and annual commercial/horticultural crops. ➢ Provides subsidy of 50 percent in premium of small and marginal farmers. The subsidy is phased out over a period of 5 years on sunset basis.

Long term loan

Name of Scheme	Eligibility	Objective/Facilities
Agricultural Term Loan	All categories of farmers (small/medium and agricultural labourers) are eligible, provided they have necessary experience in the activity and required area.	➢ The banks extend this loan to farmers to create assets facilitating crop production/income generation. ➢ Activities covered under this scheme are land development, minor irrigation, farm mechanization, plantation and horticulture, dairying, poultry, sericulture, dry land / waste land development schemes etc. ➢ This loan is offered in the form of direct finance to farmers with a repayment span not lass than 3 years and not exceeding 15 years.

8.3 Organisations providing marketing services :

Name of the organisation	Services provided
1.Directorate of Marketing and Inspection (DMI) NH-4, CGO Complex Faridabad- Website: www.agmarknet.nic.in	▶ Integrate production and marketing of agricultural and allied produce in the country. ▶ Promote of grading of agricultural and allied produce. ▶ Development of markets planning and designing of physical markets and infra-structural facility. ▶ Promotion of cold storage. ▶ Liaison between the Central and State Governments through its regional offices (11) and sub-offices (37) spread all over the country.

2.National Agricultural Co-operative Marketing Federation of India Ltd.(NAFED), 1, Siddarth Enclave, Ashram Chowk, Ring Road, New Delhi. Website: www.nafed-India.com	▶ Central nodal agency of Govt. for procurement of oilseeds and pulses under Price Support Scheme (PSS). ▶ Recognised as Export Trading House for agro commodities. ▶ Coordinate and promote the marketing and trading activities of its affiliated co-operative organizations. ▶ Promote inter-state and international trade of agricultural commodities. ▶ Provide storage facilities. ▶ Serve the consumers in Delhi through the network of its retail outlets (NAFED BAZAR). ▶ Processing of pulses, fruits, etc for internal trade.
3.Central Warehousing Corporation (CWC), 4/1 Siri Institutional Area Opp. Siri Fort New Delhi-110016 website: www.fieo.com/cwc/	▶ Provides scientific storage and handling facilities. ▶ Offer consultancy services/ training for the construction of warehousing infrastructure to different agencies. ▶ Import and export warehousing facilities. ▶ Provide disinfestations services.
4.Agricultural and Processed Food Products Export Development Authority (APEDA), NCUI Building 3, Siri Institutional Area August Kranti Marg, New Delhi 110016 Website: www.apeda.com	▶ Development of scheduled agricultural products based industries for export. ▶ Provide financial assistance to these industries for conducting surveys, sensibility studies, relief and subsidy schemes. ▶ Registration of exporters for scheduled products. ▶ Adapting standards and specifications for the purpose of export of scheduled products. ▶ Carrying out inspection of meat and meat products for ensuring the quality. ▶ Improving the packaging of the scheduled products. ▶ Promotion of export oriented production and development of scheduled products. ▶ Collection and publication of statistics for improving marketing of scheduled products. ▶ Training in the various aspects of argil-industries related to the scheduled products.
5.National Co-operative Development Corporation (NCDC), 4, Siri Institutional Area, New Delhi-110016 website: www.ncdc.nic.in	▶ Planning, promoting and financing programmes for production, processing, marketing, storage, export and import of agricultural produce. ▶ Financial support to primary, regional, State and National level co-operative marketing societies is provided towards; i) Margin money and working capital finance to augment business operations of agricultural produce. ii) Strengthening the share capital base and Iii) Purchase of transport vehicles.

6.Director General of Foreign Trade, (DGFT), Udyog Bhavan, New Delhi. Website: www.nic.in/eximpol	▶ Provide guidelines / procedure of export and import of various commodities. ▶ Allot import-export code number (IEC No) to the exporter of agricultural commodities.
7.National Research Centre for Groundnut (NRCG), PO Box No. 5, Junagadh-362001 (Gujarat). Website: www.nrcg.guj.nic.in	▶ Act as the national repository of working collection of groundnut germplasm and information on groundnut research. ▶ Offer consultancy and training. ▶ All India Coordinated Research Project on Groundnut
8.State Agricultural Marketing Boards (SAMBs),	▶ Implementation of the regulation of marketing of agricultural and allied commodities in the state. ▶ Provide infra-structural facilities for the marketing of notified agricultural produce. ▶ Provide grading of agricultural produce in the markets. ▶ To co-ordinate all the market committees for market information services. ▶ Provide aid to financially weak or needy market committees in the form of loans and grants. ▶ Eliminate malpractices in the marketing system. ▶ Arrange or organise seminars, workshops or exhibitions on subjects relating to agricultural marketing and farmers training programme on various aspects of agricultural marketing. ▶ Some of the SAMBs are also promoting agro-business.

9.0 UTILIZATION

9.1 Processing:

It has been estimated that about 80 percent of the total Groundnut produced in India undergoes processing to utilise as oil or cake. Groundnut processing mainly comprises two processes viz. seed crushing and solvent extraction. The seed crushing industry may be divided into four categories.

1. Village *ghanies* or bullock driven *kolhus*: The use of village *ghanies* has been gradually reduced and replaced by improved *Wardha ghanies,* which are considered efficient to the primitive bullock driven *ghanies.* These *ghanies* has a mortar and a wooden pestle, where the pestle is rotated by a bullock going around in a circle. Although, these *ghanies* are not very efficient extractor, they are still a substantial employer of rural labour and save a lot of transportation cost.

2. Rotaries or power operated *ghanies*: Rotary mills which are an adaptation of *ghanies* are also popular in the area, where the electricity is available. The extraction through Rotary mills is better than country *ghanies* and yield 1 to 2 percent higher.

3. Expellers: The mechanization for extraction of oil came with introduction of hydraulic press by the end of the eighteenth century. This was replaced by screw press or expeller towards the end of last century. It consists of a cylindrical cage in which a helical worm shaft moves. The cage contains openings for the drainage of the expelled oil. The flaked and cooked material adjusted to moisture content 2 to 5 percent is fed at one end and subjected to increasing pressure by the screw, which expels the cake through a constricted opening at the far end of cage. Modern expellers can reduce the oil content in the pressed cake to about 4 to 8 percent. The average yield of oil by expellers is comparatively higher than village ghanies or rotary mill.

4. The solvent extraction: This is the most modern and widely uses method. Solvent extraction industry is complementary to seed crushing industry in the sense that it recovers a major portion of oil left in oil cake coming from *ghanies*, rotaries and expellers. The basic techniques is to dissolve oil in a volatile solvent (N-Hexane) and then to distil the extract recovering solvent and oil separately. The SE (solvent extracted) Groundnut oil is in the refined and purified form and can be stored for longer period.

Status of the Vegetable Oil Industry (As on 30.09.2004)

Type of Vegetable Oil Industry	No. Of Units	Annual Capacity (Lakh MT)	Average Capacity Utilisation
Oilseed Crushing Units	1,50,000 (Approx)	425 (In terms of Seeds)	10-30%
Solvent Extraction Units	655	282 (In terms of Oil-bearing Material)	31%
Refineries attached with *Vanaspati* Units	117	34 (in terms of oil)	45%
Refineries attached with Solvent Units	271	37 (in terms of oil)	27%
Independent Refineries	647	37 (in terms of oil)	36%
Total Refineries	1000	105 (in terms of oil)	35%
***Vanaspati* Units**	244	47 (in terms of Vegetable oil products)	25%

Source : From http://fcamin.nic.in/sugar_ind.htm

9.2 Uses :

Almost every part of Groundnut has commercial value. Groundnut is an oilseed crop mainly used for edible oil purpose but used by many other ways. The main uses of Groundnut are as follows:

1. Edible Oil: The groundnut oil has several uses but mainly used as a cooking oil. It is used in many preparations. It is used in soap making, fuel, cosmetics, shaving cream, leather dressings, furniture cream, lubricants, etc. Groundnut oil is also used in making *vanspati* ghee and in fatty acids manufacturing. It is also used as medium of preservation for preparation of pickles, chutney and other preparations.

2. **Medicinal use:** its oil is used in making different types of medicated ointments, plasters, syrups, and in medicated emulsion.

3. **Food Preparation:** It is also used to make various food preparation like, butter, milk, candy & chocolate, *chatni*, groundnut pack, *laddu, barfi (chuki*i), etc.

4. **Kernels:** Whole kernels are also used as table purposes by frying, soaking, roasting, boiling and in different types of *numkeen.* Roasted Groundnut is a most popular way of eating. Kernels also used as a spice in vegetables and as sprouts for salad.

5. **Groundnut cake:** It is the liking feed for animal and poultry due to its nutritive value and palatability.

6. **Groundnut Shell:** Groundnut shell has great potential for commercial use. It is used as a fuel, filler in cattle feed, hard particle boards, cork substitutes, activated carbon etc.

7. **Groundnut straw:** Mainly used as animal feed, fuel and in preparation of compost. The green leaves and stem of plants are used as animal feed. The shell of pods obtained during threshing also used as cattle feed.

10.0 DO'S and DON'TS :

Do's	Don'ts
✓ Harvest the Groundnut when plant foliage show yellowness, pod becomes hard and tough, and there is dark tannin discolouration inside the shell and the seed become unwrinkled	✘ Harvest Groundnut before the crop matures, which means less shelling percentage, oil and protein content.
✓ Harvest the crop at proper time of maturity.	✘ Delay harvesting. It results in more pods in soil and reduces yield.
✓ Harvest crop when there is adequate moisture in the soil.	✘ Harvest crop when there is less or excess moisture in the soil
✓ Harvest in bright sunny dry weather conditions.	✘ Harvest during humid/wet weather conditions.
✓ Stripe pod properly and immediately after harvesting by adopting better mechanical methods	✘ Stripe pod late and badly as it may damage pods/kernels.
✓ Immediately dry the wet pods after harvest, preferably up to optimum moisture content i.e. not more than 5 percent.	✘ Keep high moisture in pods. It may help in fungal attack which leads to development of Aflatoxin infestation.
✓ Protect the harvested produce from rain and excessive dew by covering.	✘ Store produce in open, pods may absorbed moisture.
✓ Spread the harvested produce to dry pods properly.	✘ Make heaps of harvested produce to avoid mould formation.
✓ Threshing and winnowing on cemented (*Pucca*) floor to avoid handling losses.	*kucha* floor.
✓ Market the produce after grading to get higher return.	fetches lower prices.

✓ Avail the facility of Price Support Scheme during glut situation.	✘ during glut situation.
✓ Get the market information regularly from www.agmarknet.nic.in website, newspaper, T.V., concerned APMC offices etc. before marketing.	information regarding price, trend etc.
✓ Avail the facility of futures trading and forward contracts to avoid price risk arising due to wide fluctuation in prices.	a glut situation.
✓ Take the benefits of contract farming to insure better price of the produce.	and assuming its future demand.
✓ Store the produce during post harvest period and sell it when prices are favourable.	harvest period, because usually the prices prevail low due to more arrivals.
✓ Reap the benefit of GRAMIN BHANDARAN YOJANA scheme for construction of rural godowns and store the produce to minimise losses in qualitative and quantitative terms.	which leads to qualitative and quantitative deterioration of kernels.
✓ Provide aeration in storage to avoid dampness and pest infestation.	avoid mould formation and pest infestation.
✓ Use effective, efficient and proper post harvest technology and processing techniques to avoid post harvest losses.	techniques in post harvest operations and in processing which cause quantitative and qualitative losses.
✓ Select the shortest and efficient marketing channel to get higher share in marketing.	longer, at the cost of producer's share.
✓ Use proper and scientific method of storage to avoid aflatoxin attack.	of storage which leads Aflatoxin attack.
✓ Select the cheapest and convenient mode of transportation from the available alternatives.	causes losses, and incur more expenses on transport.
✓ Use proper packing of Groundnut to protect the quality and quantity during transit and storage.	during transit and storage.
✓ Transport Groundnut in bags which minimises losses.	enhances losses.
✓ Follow the stipulated export rules and regulations.	

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