

Status paper on Groundnut

Groundnut

1. Crop Description:

Groundnut belongs to family Leguminosae (Fabaceae) sub-family Papilionoideae. The genus *Arachis* is morphologically well defined and clearly delineated from its closest relatives by the presence of geocarpic peg. The genus *Arachis* is placed with its relatives *Stylosanthes*, *Chapmannia*, *Arthrocarpum* and *Pachecoa* in the sub-tribe *Stylosanthinae* of the tribe *Aeschynumeneae* on the basis of the shared morphological characters of a staminal tube with alternately attached basal and dorsal anthers, flowers in terminal or axillary spikes or small heads (which are sometimes raceme-like), pinnate leaves, and leaflets without stipules. The flowers are borne on axils of leaves on primary or secondary branches. The pollen matures 6 - 8 hours before anthesis. The self-pollination occurs because the stigma and anthers are enclosed by the keel. However, cross pollination (ranging from 0 to 6%) also occurs through bees. After fertilization, the elongated gynophores develop into a peg like structure and becomes sub-terranean, which are converted into pods. Groundnut pods are elongated with varying degrees of reticulation on the surface. They contain two to five seeds. Seed weight of kernel ranges from 0.15 to >1.3 g/seed/kernel.



Groundnut crop sown with Broad Bed-Furrow System

Groundnut has been classified on the basis of growth habit, branching pattern, inflorescence, pod and seed characters, seed dormancy etc. The details of most widely adopted classification of groundnut, is shown in **Table 1**.

Table 1: Classification of Groundnut

Botanical type	Subspecies	Cultivar	Branching pattern	Growth habit	Seed/pod
Virginia Bunch	<i>hypogaea</i>	<i>hypogaea</i>	Alternate	Prostrate to semi erect	2-3
Virginia Runner		<i>hirsuta</i>	Alternate	Prostrate	2-4
Valencia	<i>fastigiata</i>	<i>fastigiata</i>	Sequential	Erect	3-5
Spanish Bunch		<i>vulgaris</i>	Sequential	Erect	2

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2. Centres of origin:

Species of the genus *Arachis* are native of South America. About 100 species have been reported which are distributed between the river Amazon in the north, Rio de la Plato in the south, the Andes to the west and the Atlantic to the east. *Arachis hypogaea* is believed to have originated in northern Argentina and south Bolivia and the centre of diversity of the genus *Arachis* to be the Mato Grasso, Brazil in which majority of the species are found. Bolivia has the second largest number of species followed by Paraguay, Argentina and Uruguay.

3. Global scenario:

Groundnut is cultivated in tropical, sub-tropical and warm temperate regions between 40°N and 40°S latitudes. The production is largely confined to Asian and African countries. Asia accounts for about 50% of area and 60% of world production of groundnut with largest share of India and China (>40%) in coverage, with highest share of China (40%) in the total production of groundnut in the World. Area, production and yield of top 10 groundnut growing countries during last three years is given in **Table 2**.

Table 2: Area, Production and Yield of Groundnut Major Countries

Sr. No.	Country	Area (Lakh ha)			Production (Lakh tonnes)			Yield (Kg/ha)		
		2013-14	2014-15	2015-16	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16
1	China	46.82	46.00	46.00	169.19	164.80	165.00	3614	3580	3590
2	*India	55.10	47.69	45.55	97.10	74.02	67.71	1764	1552	1486
3	Nigeria	23.60	27.70	25.00	30.00	34.10	30.00	1271	1230	1200
4	USA	4.21	5.40	6.30	18.93	23.50	27.20	4496	4400	4310
5	Sudan	21.62	12.50	21.80	17.67	9.60	18.70	817	770	860
6	Myanmar	8.90	8.90	8.90	13.75	13.80	13.80	1545	1550	1550
7	Indonesia	5.19	6.30	6.20	11.50	11.50	11.30	2216	1830	1840
8	Senegal	7.70	8.80	11.40	7.10	6.70	10.70	922	760	940
9	Niger	7.20	7.80	7.40	2.80	4.00	3.50	389	520	470
10	Cameroon	4.63	4.70	4.00	6.36	6.40	5.50	1373	1360	1380
	Others	69.63	64.71	64.75	78.68	49.98	50.29	1130	772	777
	World	254.60	240.50	247.30	453.08	398.40	403.70	1780	1660	1630

*As per DES, DAC&FW.

4. National scenario:

Groundnut is largely cultivated in India during *Kharif* season (June to October) under rainfed conditions with low input use and high pressure of insect-pests including weeds leading to low productivity. In *Rabi* season (October to March), the crop is grown on residual moisture with protective irrigation or in river bed areas. Summer groundnut (Feb-May) grown under assured irrigation is generally practiced with high input application and low pressure of insect-pests attributing to higher productivity. Five states

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namely Andhra Pradesh, Gujarat, Karnataka, Rajasthan and Tamil Nadu account for about 80% of the total groundnut area and production of the country. Gujarat alone contributes about 35% of the total production of groundnut. State and season-wise area, production and yield of major groundnut growing states is given in **Table -3 & 4**, respectively.

Table -3: State-wise total area, production and yield of groundnut

Sr. No.	States	Area (Lakh ha)			Production (Lakh tonnes)			Yield (Kg/ha)		
		2013-14	2014-15	2015-16	2013-14	2014-15	2015-16	2013-14	2014-15	2015-16
1	Gujarat	18.40	14.00	14.14	49.20	22.20	23.58	2668	1586	1668
2	AP	13.90	10.30	7.75	12.40	7.90	8.02	892	771	1035
3	Rajasthan	4.60	5.00	5.21	9.00	10.20	10.56	1992	2024	2028
4	Tamil Nadu	3.40	3.40	3.52	9.20	9.00	8.82	2723	2699	2509
5	Karnataka	6.60	6.50	5.91	5.70	5.60	4.85	863	870	821
6	MP	2.10	2.30	2.36	3.20	3.70	3.50	1573	1602	1483
7	Maharashtra	3.20	2.40	2.40	3.90	2.50	2.37	1248	1063	988
8	Telangana	-	-	1.27	-	-	2.06	-	-	1622
9	West Bengal	0.78	0.79	0.84	2.02	2.00	2.00	2573	2544	2372
	Others	2.12	2.11	2.15	2.48	2.50	1.95	1308	1639	907
	All India	55.10	46.80	45.55	97.10	65.60	67.71	1764	1400	1486

Table-4: State-wise area, production and yield of groundnut during Kharif & Rabi/Summer during 2015-16

Sr. No.	States	Area (Lakh ha)			Production (Lakh tonnes)			Yield (Kg/ha)		
		Kharif 2015	Rabi/summer 2015-16	Total	Kharif 2015	Rabi/summer 2015-16	Total	Kharif 2015	Rabi/summer 2015-16	Total
1	AP	6.82	0.93	7.75	5.98	2.04	8.02	877	2194	1035
2	Gujarat	13.55	0.59	14.14	22.41	1.17	23.58	1654	1983	1668
3	Karnataka	4.10	1.81	5.91	2.73	2.12	4.85	666	1171	821
4	MP	2.36	0.00	2.36	3.50	0.00	3.50	1483	00	1483
5	Maharashtra	1.86	0.54	2.40	1.81	0.56	2.37	973	1037	988
6	Rajasthan	5.17	0.04	5.21	10.49	0.07	10.56	2029	1830	2028
7	Tamil Nadu	2.11	1.40	3.51	4.76	4.06	8.82	2250	2900	2509
8	Telangana	0.13	1.14	1.27	0.21	1.85	2.06	1615	1623	1622
9	West Bengal	0.03	0.82	0.85	0.02	1.98	2.00	960	2415	2372
	Others	1.80	0.35	2.15	1.49	0.45	1.94	828	1286	907
	All India	37.93	7.62	45.55	53.40	14.30	67.70	1408	1877	1486

Groundnut is a most sensitive crop to moisture stress. Distribution of rainfall plays a greater role than the quantum of rains received during the crop season. Longer dry spell at the time of peg formation/penetration and grain filling is most injurious to both the yield and quality of groundnut. Therefore, protective irrigation at the time of peg formation/penetration and grain filling has a significant role in yield improvement.

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5. Potential districts:

More than 80% production of groundnut comes from 05 States namely Gujarat (40%), AP (12%), Tamil Nadu (12%), Rajasthan (13%) and Karnataka (7%). Details of 52 potential districts of AP (6), Gujarat (10), Karnataka (12), Maharashtra (6), Rajasthan (5), Tamil Nadu (7), Telangana (3) and Odisha (3) is given at **Annexure-I**.

6. Scope for area expansion:

Productivity and the quality of rabi/summer groundnut is much better than the kharif season. Area under rabi/summer groundnut may be enhanced with the use of micro irrigation appliances like sprinkler/drip in the states of AP, Gujarat, Karnataka, Maharashtra, UP and West Bengal. Cotton/potato fields, which are normally vacated around mid of February/March, could be more profitably used for groundnut cultivation with added advantage of soil health improvement. River bed areas in eastern and North Eastern Region particularly in Assam and Odisha provides scope for area expansion under rabi/summer groundnut.

7. Yield gap:

Among top 10 groundnut producing countries, an average (2013-16) yield of 1610 kg/ha of India as against the world average 1691 kg/ha and highest average yield of 4379 kg/ha of USA indicates a gap of 5% over world average and larger gap of 172% over highest yield of USA. However, the state average yield of 2668 kg/ha of Gujarat during a good monsoon year (kharif 2013) and normal state average yield of 2618 kg/ha of Tamil Nadu and 2498 kg/ha of West Bengal are much higher than the world average yield and also comparable with the yield of China, second high yielding country after USA. Frontline Demonstrations of groundnut conducted during Rabi 2012-13 and kharif 2013 indicates an yield gap of 46% and 15% over national average yield during Rabi/Summer and Kharif season respectively except a negative yield gap in Tamil Nadu (**Table-5 & 6**). The yield gap recorded under FLDs could be minimized by adopting improved technologies including use of protective irrigation.

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Table-5: Yield gaps recorded under FLDs of groundnut during Rabi 2012-13

(Yield in kg/ha)

State	SAY	FLD	Yield Gap (%)	Varieties used in FLD
AP	1906	2787	46	Kadari-6, Kadari-9, Harithandra, Dharani.
Gujarat	2013	2535	26	GJG-31, TG-37-A,
Karnataka	760	2851	275	GPGD-5, GPGD-4, DH-216, Kadari-9, DH-101, TGLPS-3
Maharashtra	1455	2272	56	JL-501, TPG-41, Phule-6021, TKG-Bold
Rajasthan	1258	2593	106	TG-37-A
Tamil Nadu	2998	2130	-40	VRI (Gn)-6,
West Bengal	2585	3190	23	TG-24, TG-51
All India	1812	2654	46	

Table-6: Yield gaps recorded under FLDs of groundnut during Kharif 2013

(Yield in kg/ha)

State	SAY	FLD	Yield Gap (%)	Varieties used in FLD
AP	892	1520	70	K-6, Dharani
Gujarat	2716	1873	-45	GJG-9, GJG-17, GJG-22
Karnataka	863	1660	92	Chintamani-2, TPG-39, JSP-39, Dh-36, GPBD-5
Maharashtra	1248	2417	94	AK-303, TKG-Bold, Phule Unnati, JL-501, Phule-6021, TAG-24, KDG-128
Rajasthan	1992	2931	47	TAG-24, Mallika
West Bengal	917	1982	116	TAG-24, TG-51
All India	1764	2021	15	

8. Cropping system:

About 60 % of the total groundnut cultivated area is under mono-cropping during kharif season. Major cropping system followed by various groundnut growing States are given in **Table-7**.

Table-7: Major Cropping System of Various Groundnut Growing States

State	Kharif Rainfed	Rabi - Residual Moisture	Rabi/Summer-Irrigated
Andhra Pradesh	Groundnut-Sorghum	Groundnut-Bengal gram	Groundnut-Maize
	Groundnut-Millet	Groundnut-Safflower	Groundnut-Wheat
	Groundnut-Tobacco	Groundnut-Sesame	Groundnut-Onion
Gujarat	Groundnut-Sesame	Groundnut-Fodder Sorghum	Groundnut-Mustard-Green gram
		Groundnut-Mustard	Groundnut-Wheat-Green gram

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State	Kharif Rainfed	Rabi - Residual Moisture	Rabi/Summer-Irrigated
Karnataka	Groundnut-Sorghum	Groundnut-Safflower	Groundnut-Wheat
			Groundnut-Maize
			Groundnut-Sunflower
Maharashtra	Groundnut-Sorghum	Groundnut-Safflower	Rice-Potato-Groundnut
		Groundnut-Fodder Maize	Groundnut- <i>Rabi</i> Sorghum
			Groundnut-Safflower
Tamil Nadu	Groundnut-Sesame	Groundnut-Sesame	Rice-rice- Groundnut
	Groundnut-Cotton		Groundnut-Rice-Green gram
			Groundnut-Maize
Rajasthan	Groundnut-Pearl millet	Groundnut-Barley	Groundnut-Wheat-Green gram
		Groundnut-Mustard	Groundnut-Wheat
MP	Groundnut-Sorghum	Groundnut-Safflower	Groundnut-Wheat/ Mustard
Orissa	Groundnut-Sorghum/Pearl millet	Groundnut-Bengal gram	Groundnut-Rice/Ragi
		Groundnut-Sesame	Groundnut-Coriander/Cumin

Groundnut crop suites well under inter-cropping with coarse cereals, pulses, cotton and also with other oilseeds. The major inter-cropping system of are given in **Table-8**.

Table-8: Major Intercropping Systems of groundnut

Intercropping system	Ratio	States
Groundnut + Red gram	6 :1 or 8 : 1 or 10 : 2	AP, Gujarat, Karnataka, MP,
Groundnut + Cotton	3:1 or 5 : 1	Karnataka and Tamil Nadu
Groundnut + Sorghum/Ragi	6 : 1	Karnataka and Maharashtra
Groundnut + Pearl Millet	3:1 or 4:1	AP and Rajasthan
Groundnut+Cowpea/Blackgram/ Greengram	6:1	AP and Tamil Nadu
Groundnut + Castor	5 : 1 or 7 : 1	AP, Gujarat and Tamil Nadu
Groundnut + Sesame/Sunflower	4:1 or 6:1	Gujarat, MP, Tamil Nadu and Rajasthan
Groundnut + Soybean	4:1 or 6:1	MP

9. Improved varieties:

All India Co-ordinate Research Project (AICRP) on Groundnut later on upgraded into National Research Centre of Groundnut has now been converted into Directorate of Groundnut Research (DGR) and located in GAU Campus, Junagarh. DGR is entrusted with development of new varieties and improved production technologies. After inception of AICRP >150 varieties of groundnut have been released for different agro-ecological situations, out of which old varieties like TMV-2, TMV-7, GG-11, Chitra Kaushal, SV-xi, JL-24 Polachi-1, GAUG-10, and new varieties like K-6,K-9, TG37-A,

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GBPD-4, GBPD-5, Narayani, ICGV-91114, TPG-41, TG-38, VRI-6 have become popular among the farmers for large scale cultivation. Variety GBPD-4 in Karnataka, Rajasthan & TN; TG 37A in AP, Chhattisgarh, Gujarat & Karnataka, MP, Odisha; TPG-41 in AP, Chhattisgarh, Karnataka, TN; Kadri-6 & Narayani in AP; have shown significant yield gains over local varieties under minikits programme. Among new varieties K-9, Harithandra, Dharani, GJG-31, TPG-41, GPBD-4, GPBD-5, Phule-6021, Phule Unnati, GJG-17, TG-51 have shown significant yield gains under FLD during rabi-2012-13 and Kharif-2013. List of improved varieties of groundnut, which are <15 year old and eligible for assistance under National Mission on Oilseeds and Oil Palm (NMOOP) is given in **Annexure-II**.

The seed supply position given in **Table -9** indicates that old varieties TMV-2 released during 1976 is most prominent in majority of groundnut growing states except Gujarat with >50% share in seed supply during Kharif-2011. Similarly, GG-20 released during 1992 has a share of >75% in Gujarat. These 02 varieties have been acclimatized under adverse a weather condition and also preferred in the market.

Table-9: Variety wise certified seed distribution of Groundnut during 2009-10 to 2011-12.

S. No.	(Quantity in Qtl)			
	State	Variety	Year of release	2011-12
1	AP	GPBD-4	2004	70
		K-6	2005	107928
		TAG-24	1992	16963
		TG-37-A	2004	144
		TMV-2	1976	60107
		JL-24	1984	21747
		Narayani	2002	23415
		Total		230374
2	Gujarat	GG-20	1992	34903
		TAG-24	1992	1297
		TG-37-A	2004	194
		TG-38	2006	626
		TPG-41	2004	165
		GG-2		2390
		GG-11		3843
		GAUG-10		980
		Total		44398
3	Karnataka	GPBD-4	2004	11806
		K-6	2005	4906
		TAG-24	1992	631
		TG-37-A	2004	3206
		TMV-2	1976	214846
		JL-24	1984	327
		ICGV-91114	2007	521
		TPG-41	2004	499
Total		236742		

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S. No.	State	Variety	Year of release	2011-12
4	Maharashtra	K-6	2005	6230
		TAG-24	1992	5890
		TG-37-A	2004	896
		TMV-2	1976	945
		JL-24	1984	1527
		GG-20	1992	326
		Total		15814
5	Rajasthan	GPBD-4	2004	1443
		TG-37-A	2004	163
		Total		1606
6	Tamil Nadu	TG-37-A	2004	210
		K-6	2005	14154
		TAG-24	1992	173
		GPBD-4	2004	382
		TMV-2	1976	24050
		JL-24	1984	2780
		TMV-7	1985	13840
		VRI-2	1989	3380
		VRI-3	1991	2390
		CO (GN)-4	2001	2070
		Total		63429
		7	West Bengal	GPBD-4
K-6	2005			8117
TAG-24	1992			2423
TMV-2	1976			33903
Total				45516
		All India		637879
			TMV-2	333851
			% of TMV-2	52

10. Seed scenario:

Agricultural Statistics at a Glance- 2015 indicates good SRR of 43% with supply of about 30 lakh qtl. of certified seed of groundnut for a total area of 46.80 lakh ha sown during Kharif-2014. The year-wise SRR of groundnut during last 3 years is given in **Table-10**.

Table-10: Year-wise SRR of groundnut

Year	Area sown (lakh ha)	Total seed required @75 kg/ha (lakh qtl.)	Seed supplied (lakh qtl.)	SRR (%)
2012-13	47.20	70.80	25.73	36
2013-14	55.10	82.65	30.22	37
2014-15	46.80	70.20	29.99	43

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11. **Best Practices:**

11.1. **Soil and Climate:**

Warm and moist conditions are highly congenial for groundnut cultivation. Temperature, light intensity, rainfall and humidity significantly influence the productivity of groundnut. Optimum temperature of 25-35 °C is required for good germination, flowering and pod formation. Sandy-loam soils rich in organic matter is considered best for the crop.

11.2 **Sowing time:**

- *Kharif*-groundnut- June to July subject to onset of monsoon.
- *Rabi* groundnut-November.
- *Summer* groundnut-February-March.

11.3 **Methods of sowing:**

- Line sowing on flat –bed system.
- Criss-cross sowing on flat –bed system.
- Broad Bed and Furrow System.
- Ridge and Furrow System.

11.4 **Seed rate, spacing and plant population:**

- Bunch type groundnut varieties- 100-110 kg seed /ha.
- Spreading and semi-spreading varieties- 95-100 kg seed /ha.
- Spacing for bunch type varieties- 30 x 10 cm with plant population of 3.33 lakh/ha.
- Runner type varieties- 45 x 10 cm or 15 cm with plant population of 2.22 lakh/ha.

11.5 **Manures and Fertilizers:**

- For every one tonne of pod yield and two tonne of haulm yield, groundnut crop removes 60 kg nitrogen, 11 kg Phosphorous, 46 kg Potassium, 27 kg Calcium and 14 kg Magnesium from the soil.
- To obtain higher yield well decomposed farm yard manure @ 10 t/ha should be applied at least 21 days before sowing of crop.
- State wise recommended doses of NPK fertilizers under rainfed and irrigated situation and correction of micronutrient deficiencies are given in **Table-11** and **Table-12**.

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Table-11: Recommended doses of NPK for different states

State	Situation	N-	P -	K (kg/ha)
Andhra Pradesh	Rainfed	20	40	20
	Irrigated	30	60	45
Gujarat	Rainfed	12.5	40	0
	Irrigated	25	50	0
Karnataka	Rainfed	15	30	25
	Irrigated	25	75	25
Madhya Pradesh	Rainfed	20	40	20
Punjab	Irrigated	15	40	25
Rajasthan	Rainfed	20	60	0
	Irrigated	20	60	0
Maharashtra	Irrigated	20	40	0
Uttar Pradesh	Rainfed	15	30	45
West Bengal	Irrigated	15	30	45
Tamil Nadu	Rainfed	11	22	33
	Irrigated	22	44	66

Table-12: Correction of Micronutrient Deficiencies

Micronutrient	Form and rate of application to soil	Spray schedule
Boron	Borax 5-20 kg/ha	0.2% Borax
Copper	Copper Sulphate 5-10 kg/ha	0.1% Copper Sulphate + 0.05% lime
Manganese	Manganese Sulphate 10-50 kg/ha	0.6% Manganese Sulphate +0.3% lime
Zinc	Zinc Sulphate 10-50 kg/ha	0.5% Zinc Sulphate + 0.2 % Lime
Molybdenum	Sodium or Ammonium Molybdate 0.5-1.0 kg/ha	0.07-0.1% Ammonium Molybdate
Iron	Ferrous Sulphate 10 kg/ha	0.5% Ferrous Sulphate + 0.02% Citric Acid

11.6 Water Management:

Groundnut crop is mostly cultivated during *kharif* under rainfed conditions (80%).

- Crop could with stand up to 25 days of emergence without irrigation/rainfall.
- Rainfall/protective irrigation is necessary at flowering (20-40 DAS), pod formation (40-70 DAS) and pod filling (70-100 DAS).
- Eight irrigations are adequate for optimal yield i.e. pre –sowing irrigation followed by an irrigation at 25 DAS, 4 irrigations at 10 days interval and final two irrigations at 15 days interval.
- Sprinkler irrigation is ideal for the crop grown under sandy soils.

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- Drip irrigation is becoming popular among groundnut growers as it increases crop yield by 25-40% besides improving seed quality and saves up to 40-50% irrigation water compared to flood irrigation.

11.7 Weed management:

The average yield loss due to weeds is about 45%. Important weed flora in the groundnut crop are: *Amaranthus viridis* (Jangli Chaulai), *Boerhaavia diffusa* (Vishakhapra), *Cyperus rotundus* (Motha), *Cyperus esculentus* (Yellow nut sedge), *Cynodon dactylon* (Doob grass), *Digera arvensis* (Laksha), *Convolvulus arvensis* (Hiran khuri), *Argemone maxicana* (Satyanashi), *Anagallis arvensis* (Krishna neel), *Desmodium trifolium* (Tinpatia), *Commelina benghalensis* (Kankawa), *Celosia argentea* (White cock's comb) and *Portulaca oleracea* (Pig weed). Some of the weed management practices are given below.

- Adopting right spacing between rows and within the row.
- Mulching the soil surface in between rows with crop residue material like straw etc may prevent the germination of weed seeds.
- Adoption of crop rotation and intercropping.
- Two hand weeding, first around 20 days after sowing and 2nd at about 35 days after sowing.
- Inter-cultivation usually starts around 10 days after emergence and continues up to 35 DAS at 7– 10 days interval till pegging begins.
- Use of herbicides is given in **Table-13**.

Table-13: Herbicides recommended for use in Groundnut

Herbicide	Rate of application (kg a.i./ha)	Time of application
Pendimethalin	1.0-2.0	Pre-emergence
Oxyfluorfen	0.25-0.50	-do--
Quizalofop ethyl	0.050	Post-emergence
Imazethapyr	0.050	-do-

11.8 Important Insects/Pests:

The details of major insects, disease and nematode are given in **Table-14**.

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Table-14: Important Insects/Pests of Groundnut crop

Name pests	Scientific name	Possible yield loss (%)	Period of Occurrence
Leaf Miner	<i>Aproaerema modicella</i> (Deventer)	16-92	Mar-Oct
Tobacco Caterpillar	<i>Spodoptera litura</i> (Fab.)	15-30	Mar-Oct
Hairy Caterpillars	<i>Amsacta albistriga</i> (Walker), <i>A. moorei</i> (Butler) and <i>Spilosoma obliqua</i> (Walker)	26-100	June-Oct
Thrips	<i>Caliothrips indicus</i> Bagnell, <i>Frankliniella schultzei</i> Trybom, <i>Thrips palmi</i> Karny and <i>Scirtothrips dorsalis</i> Hood	15-28	Mar-Oct
Aphids	<i>Aphis craccivora</i> Koch	Up to 40	July-Sept
Leafhoppers/ Jassids	<i>Empoasca kerri</i> Pruthi, <i>Balclutha hortensis</i> Lindb.	9-22	Mar-Oct
White grub	<i>Holotrichia consanguinea</i> Blanch and <i>H. serrata</i> (Fab.)	20-100	Aug-Oct
Termites	<i>Odontotermes obesus</i> (Rambur) and <i>Microtermes obesi</i> (Holgren)	5-46	Sept-Oct
Bruchid	<i>Caryedon serratus</i> (Olivier)	Varied	Throughout the year
Collar rot	<i>Aspergillus niger</i> van Tieghem.	28 – 47	-
Stem rot	<i>Sclerotium rolfsii</i> Sacc. Teleomorph: <i>Athelia rolfsii</i> (Curzi) Tu & Kimbrough.	27	-
Early Leaf Spot	<i>Cercospora arachidicola</i> S. Hori. Teleomorph: <i>Mycosphaella arachidis</i> Deighton)	Up to 60	-
Rust	<i>Puccinia arachidis</i> Speg.	10-52	-
<i>Alternaria</i> Leaf Blight & Leaf Spot	<i>Alternaria alternata</i> , <i>A. tenuissima</i> and <i>A. Arachis</i>	up-to 22	Summer
Peanut Bud Necrosis Disease	Peanut Bud Necrosis Virus (Tospovirus)	30-90	-
Root knot	<i>Meloidogyne arenaria</i> , <i>M. hapla</i> and <i>M. Javanica</i>	21.6	-
Kalahasti Malady	<i>Tylenchorhynchus Brevelineatus</i>	40-50, Endemic in Chittoor and Nellore district of A.P.	-

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11.9 The integrated pests management practices in groundnut :

- Deep ploughing during April-May to expose pupae to sunlight and predatory birds.
- Clean cultivation by rouging out weed hosts and self-sown plants.
- Growing of resistant varieties like, BR 2, ICGV 87160, ICGV 86031, ICGV 86699 (Leaf Miner), ICGV 86590 (*Spodoptera*), BG 2, Girnar 1 (aphids), Girnar 1, Co-1, Dh-3-30, ICGS 11, MH 1, POL 2, S 206 (Leafhoppers) and Girnar 1 (Thrips).
- Early sowing escapes the damage caused by Leaf Miner and White Grubs.
- Intercropping with Soybean (Leaf Miner), Castor (*Spodoptera*), Cowpea (Hairy Caterpillars, Aphid and Leafhopper) and Pearl millet (Thrips).
- Set up the petromax light traps @ 1-2/ha to attract and kill the moths during June-August.
- Install pheromone traps @ 10 traps/ha for *Spodoptera* and *Helicoverpa* and 25 traps/ha for leaf miner.
- Spray neem oil @5ml/ltr water alongwith suitable surfactant like soap powder @ 1g/ltr or NSKE 5% as it acts as oviposition deterrent.
- Erect bird perches @ 10-12/ha.
- Conserve the natural enemies like, Coccinellids, Spiders, Hymenopteran and Dipteran Parasitoids.
- Release *Trichogramma chilonis* @ 50000/ha, two times at 7-10 days interval followed by release of *Bracon hebetor* @ 5000/ha two times at 7-10 days against Leaf Miner and Defoliators.
- Spray commercial formulation of Nuclear Polyhedrosis Virus (NPV) for the management of *Spodoptera* and *Helicoverpa* @ 250 LE (6×10^9 /LE /ha) and @ 200 LE for Hairy Caterpillars.
- Spray *Bacillus thuringiensis* @ 1-1.5 kg/ha against Hairy Caterpillars, *Spodoptera* and *Helicoverpa*.
- Spray entomopathogenic fungus like, *Nomuraea rileyi* and *Beauveria bassiana* @ 2g/ltr of water for lepidopteran Caterpillars and *Verticillium lecanii* for sucking pests.

11.10 The integrated disease management practices in groundnut are:

- Deep burial of surface organic matter and crop debris.
- Use good quality seeds of resistant/tolerant varieties.
- Seed treatment with commercial formulation of *Trichoderma harzianum* or *T. viride* or *Pseudomonas fluorescens* @ 10g/kg seed or Thiram or Carbendazim or Captan or Mancozeb @ 3-4g/kg seed or Tebuconazole (Raxil 2 % DS) @ 1.25g/kg.
- Avoidance of deep sowing and injury to the seedling.
- Crop rotation with wheat and gram, mixed cropping with mothbean.
- Soil application of neem cake or castor cake @ 500kg/ha or neem seed kernel powder @ 3-5%.

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- Foliar application of Carbendazim (0.025%) + Mancozeb (0.2%) at 2-3 weeks interval, 2 or 3 alternate spray of Mancozeb (0.2 %), Carbendazim (0.02 %) and Mancozeb (0.2 %) or three sprays of Chlorothalonil (0.2 %) or Hexaconazole (0.005 %) or Difenconazole 25% EC @ 2ml/L at 30, 50 and 70 DAS effectively reduces the early leaf spot and late leaf spot severity.
- Spray Mancozeb (0.2 %) or Copper Oxochloride (0.2 %) and destroy the collateral weeds and self-sown plants.

11.11 The integrated nematode management practices in groundnut are:

- Crop rotation with poor or immune host crops like cereals.
- Deep summer ploughing.
- Soil solarization by a transparent polythene sheet (25-50 µm) for 15 days during summer also helps to control nematodes. Soil amendments such as neem cake or castor cakes @ 1 tonnes/ha preferably seven days prior to sowing has been found to reduce nematode population. Their combination with seed treatment, with Carbosulfan (25 DS) @ 3% a.i. (W/W) further improves efficacy in reducing the nematode population and enhancing yield significantly.
- Use resistant varieties like Tirupathi-2 and 3 for the management of Kalahasti malady disease.
- Farmers of south Saurashtra region of Gujarat may use groundnut with castor as an intercrop (row ratio 2:1) along with soil application of Carbofuron @ 1kg a.i./ha to reduce the population of root-knot nematodes.

11.12 Harvesting and Storage:

Select five to ten plants randomly and break and open each pod. Pods with prominent veins, dark coloured inside of the shells and the kernels are the indicatives maturity of crop. Pods should not be detached immediately after uprooting the plants, which may be allowed to dry first along with vines. The produce may be dried till the pod moisture is reduced to 8%.

Post-harvest losses in groundnut are mainly inflicted by the bruchids and Aflatoxin contamination, which severely affect the nutritional qualities and export of groundnut. Best storage conditions for groundnuts is about 8.0% kernel moisture content at 10°C and 65% relative humidity. Groundnuts always should be stored as pods rather than as kernels. Small farmers store groundnut as pods, in earthen pots, mud bins, bamboo baskets. Such containers are often plastered with mud and cow dung with little or no use of pesticides. For long-term storage the containers are sealed with mud after the addition of ashes, dried neem leaves or other local herbs to control storage pests. Use new / clean gunny bags to store the produce. Stack the pod-filled gunny bags on wooden planks keeping a metre gap from the walls and store them in well aerated, waterproof storage. Spray Malathion 1.25 % or Deltamethrin 0.04% on the walls, floor and roof of the Warehouses or Godowns before storage and use Aluminium Phosphide @ 3-5 tablets/ tonnes of pods for the management of bruchids. Prevent insect damage to the pods in storage by fumigating with phosphine (use 3-5 Aluminium Phosphide tablets for every 100 kg of pods for 7-8 days).

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12 Marketing Support:

Groundnut is covered under Minimum Support Price (MSP), which is announced well before the harvesting of crop. National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) is the Nodal agency to undertake procurement of groundnut under Price Support Scheme (PSS). Year wise details of MSP and Average Market Price of groundnut during peak seasons of last three years given in **Table-15** indicates that the price of groundnut invariably falls below MSP. The quality of Kharif groundnut is mainly depend on the receipt of rainfall at the time of pod formation and grain filling. The poor quality of produce did not meet the norms of FAQ.

Table-15: MSP v/s Average Market Price (AMP) of Groundnut.

State/MSP	Avg. Price of November and December		
	2013	2014	2015
MSP (Rs. / qtl.)	4000	4000	4030
AP	4000	4100	4400
Gujarat	3390	3812	4042
Karnataka	2668	3000	3403
Rajasthan	3580	3475	3898
Tamil Nadu	4437	3445	3520

13 Nutritive values:

Groundnut is known as Indian almond and eaten as roasted/boiled. A variety of value added products like peanut butter, *chikki*, *milk*, *burfi*, *bhujia* and biscuits. About 40% of groundnut kernels are used as seed, food and feed and remaining 60% is used for oil extraction. The groundnut shell used in various industry as fuel, filler in fertilizers and cattle fields, preparation of particle boards/papers. Use of groundnut shell in oil extraction of mustard facilitate better recovery and low energy consumption. De-oiled groundnut cakes is used in animal and poultry feeds.

14 Export demand:

Among oilseeds groundnut has highest share in export. Groundnut kernels of Hand Picked Selection (HPS) grades are exported in bulk quantities for table purposes. Indonesia, Vietnam, Malaysia, Philippines, Thailand are the major buyers of groundnut from India. Besides, the groundnut kernels, food products, oil including peanut butter and oil cakes are also exported in a sizeable quantity. Year wise quantity and value of export is given in **Table-16**.

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Table-16: Export of groundnuts and its products

(Quantity in tonnes and value Rs. in crores)

Products	2012-13		2013-14		2014-15	
	Qty	Value	Qty	Value	Qty	Value
Groundnut	535637	4065.36	9830210	17070.13	390438	8128.60
Food products	4847	40.80	7944	71.46	13096	119.02
Groundnut oil	22894	292.61	6511	58.94	38952	343.15
Oil cakes	4006	10.42	8711	22.72	4147	21.90
Total	567384	4409.19	9853376	17223.25	446633	8612.67

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Source: Oilseeds statistics – A compendium – 2015 from ICAR- IIOR

15 Researchable issues

- Resistance variety / technology for control of Peanut Bud / Stem Necrosis.
- Resistant variety / technology for control for clamp virus disease.
- Resistant varieties/technology for control of aflatoxin.
- The old varieties like TMV-2, Pollachi red in Southern states, GG-20 and GG-2 in Gujarat are mainly preferred because of their better performance under adverse weather conditions and market preference. Some bio-technological studies may be undertaken to transfer cytoplasm/gene from such varieties to other high yielding varieties.
- White Grub, which was a major problem in Rajasthan earlier has now extended in Gujarat. Therefore, effective control measures for white grub need to be firmed up on top priority basis.

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Annexure-II

Details of <15 years old varieties of Groundnut (*Arachis hypogaea*)

Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
AK 159	2002	PKV, Akola	1606	51	Maharashtra and Madhya Pradesh	Early (105-110 days) maturity; recommended for <i>kharif</i> season
Kalahasti (TCGS 320)	2002	ANGRAU, Tirupati	3764	52	Andhra Pradesh	Tolerant to Peanut Bud Necrosis Disease (PBND) and Jassids; suitable for <i>rabi</i> season in kalahasti malady endemic areas and also for <i>kharif</i> in north coastal and north Telangana regions
Narayani (TCGS 29)	2002	ANGRAU, Tirupati	3764	48	Andhra Pradesh	Tolerant to mid-season moisture stress conditions; recommended for both <i>kharif</i> and <i>rabi</i> -summer seasons
Sneha*	2002	KAU, Vellayani	-	-	Kerala	Recommended for <i>kharif</i> season
Snigdha*	2002	KAU, Vellayani	-	-	Kerala	Recommended for <i>kharif</i> season
GG 6	2003	JAU, Junagadh	2782	50	Gujarat	Suitable for cultivation in summer
GG 14 (JSP 28)	2003	JAU, Junagadh	2159	52	Northern Rajasthan, Punjab, Haryana, Uttar Pradesh	Tolerant to thrips, <i>Spodoptera</i> and leaf miner; recommended for <i>kharif</i> season
TPG 41	2004	BARC, Mumbai	2008	49	All India	Moderately resistant to rust; bold-seeded (HSM > 60g); high O/L ratio; recommended for <i>kharif</i> season
TG 37A	2004	BARC, Mumbai	1900	48	All India	Tolerant to collar rot, rust and late leaf spot; suitable for both <i>kharif</i> and <i>rabi</i> -summer seasons; possess fresh seed dormancy up to 15 days
Vikas (GPBD 4)	2004	UAS, Dharwad	1900-2200	49	All India	Resistant to LLS and rust; recommended for <i>kharif</i> season
TLG 45	2004	MAU, Latur	1506	51	Maharashtra	Large-seeded (HSM = 59 g); medium maturity (114 days); recommended for <i>kharif</i> season

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
SG 99	2004	PAU, Ludhiana	2501	52	Punjab	Tolerant to bud necrosis disease; possess long fresh seed dormancy (30days); suitable for summer season
Phule Unap (JL 286)	2004	MPKV, Jalgaon	2231	49	Maharashtra	Tolerant to LLS, rust and stem rot; also tolerant to thrips, leaf miner and <i>Spodoptera</i>
Prutha (Dh 86)	2005	UAS, Dharwad	4022	48	Recommended for All India	Tolerant of LLS and sucking pests; suitable for rabi-summer season
Kadiri 5	2005	ANGRAU, Kadiri	1800-2200	48	Andhra Pradesh	Tolerant to leaf spots and drought; recommended for kharif season
Kadiri 6 (K 1240)	2005	ANGRAU, Kadiri	1800-2400	49	Andhra Pradesh	Tolerant to leaf spots; recommended for kharif season
Pratap Mugphali 2 (ICUG 92195)	2005	MPUA&T, Udaipur	1800-2800	49	Rajasthan	Tolerant to Early Leaf Spot (ELS), LLS and PBNB; tolerant to Spodoptera,, leaf miner and thrips; recommended for kharif season
Pratap Mugphali 1 (ICUG 92035)	2005	MPUA&T, Udaipur	2500.-3000	49	Rajasthan	Moderately resistant to ELS, LLS and PBNB; moderately resistant to <i>S. litura</i> , leaf miner and thrips; recommended for kharif season
Co (GN) 5	2005	TNAU, Vridhachalam	1585	54	Tamil Nadu	Tolerant to rust, PBNB; tolerant to leaf miner and Spodoptera; recommended for kharif season
Ratneshwar (LGN 1)	2005	MAU, Latur	1487	51	Maharashtra	Moderately resistant to LLS, stem rot, rust and PBNB; tolerant to sucking pests; recommended for kharif season
Utkarsh (CSMG 9510)	2005	CSAUAT, Mainpuri	21.92	49	Uttar Pradesh, Punjab, Northern Rajasthan	Resistant to rust, possess fresh seed dormancy up to 40-45 days; recommended for kharif season
Durga (RG 382)	2005	RAU, Durgapura	2203	55	Rajasthan	Suitable for sandy and loamy soils; recommended for <i>kharif</i> season
GG 21 (JSSP 15)	2005	JAU, Junagadh	1843	53	Uttar Pradesh, Punjab, northern Rajasthan	Recommended for <i>kharif</i> season
TMV (Gn) 13	2006	TNAU, Coimbatore	2580	50	Tamil Nadu	Tolerant to early and mid season moisture deficit stress conditions; recommended for <i>kharif</i> season

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
GG 8 (J 53)	2006	JAU, Junagadh	1716	46	Northern Maharashtra and M P	Moderately tolerant to PBNB, collar rot and stem rot diseases
TG 38B (TG 38)	2006	BARC, Mumbai	2768	48	Orissa, West Bengal and north eastern states	Tolerant to stem rot; suitable for <i>rabi</i> -summer season
Prasuna (TCGS 341)	2006	ANGRAU, Tirupati	2000-2500(R) 4000-4500 (I)	50	Andhra Pradesh	Tolerant to <i>kalahasti</i> malady; recommended for <i>kharif</i> season
Abhaya (TPT 25)	2006	ANGRAU, Tirupati	2300 (R) 3756 (I)	52	Andhra Pradesh	Tolerant of LLS, jassids and thrips and <i>Spodoptera</i> , tolerant to early and mid season moisture deficit stress; suitable for both <i>kharif</i> and <i>rabi</i> -summer seasons
GG 16 (JSP 39)	2006	JAU, Junagadh	2058	46	Tamil Nadu, Andhra Pradesh, Kerala, southern Maharashtra	Tolerant to bud necrosis, root rot diseases; tolerant to <i>thrips</i> , <i>Spodoptera</i> , leaf miner; recommended for <i>kharif</i> season
Vasundhara (Dh 101)	2007	UAS, Dharwad	2877	50	West Bengal, Orissa, Jharkhand and Assam	Tolerant to stem rot and PBNB; tolerant to <i>thrips</i> and <i>Spodoptera</i> ; suitable for <i>rabi</i> -summer season
ICGV 91114	2007	ICRISAT, Hyderabad	2000	48	Andhra Pradesh	Tolerant to rust and LLS; early maturity (100 days); tolerant to drought; recommended for <i>kharif</i> season
AK 265	2007	PDKV, Akola	1903	47	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu	Resistant to foliar diseases; drought tolerant; recommended for <i>kharif</i> season
M 548	2007	PAU, Ludhiana	2185	51	Punjab	Tolerant to leaf spots and collar rot; recommended for <i>kharif</i> season
AK 303	2007	PDKV, Akola	2100	49	Maharashtra	Bold seeded (HSM = 80g); recommended for <i>kharif</i> season

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
TG 51	2008	BARC, Mumbai	2675	49	West Bengal, Orissa, Jharkhand and Assam	Tolerant to stem rot and root rot; suitable for <i>rabi</i> -summer season.
Ajeya (R 2001-3)	2008	UAS, Raichur	2440	46-48	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu	Resistant to PBNB; drought tolerant; recommended for <i>kharif</i> season
Girnar 2 (PBS-24030)	2008	NRCG, Junagadh	2907	51	Uttar Pradesh, Punjab, northern Rajasthan	Virginia bunch type with 'stay green' leaves and bold seeded (HSM =62g); tolerant to rust, LLS PSND; recommended for <i>kharif</i> season
ICGV 00348	2008	TNAU, Vridhachalam	2013	47	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu	Tolerant to late leaf spot and rust; recommended for <i>kharif</i> season
VRI (Gn) 7	2008	TNAU, Vridhachalam	1865	48	Tamil Nadu	Moderately resistant to leaf miner, LLS and rust; recommended for <i>kharif</i> season
VL-Moongphali-1	2008	VPKAS, Almora	1943	-	Uttarakhand	Resistant to late leaf spot and root rot; recommended for <i>kharif</i> season
VRI (Gn) 6 (VG 9816)	2009	TNAU, Vridhachalam	2259	47	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu	Tolerant to LLS, rust, PBNB; recommended for <i>kharif</i> and <i>rabi</i> -summer seasons
Jawahar Groundnut 23 (JGN 23)	2009	JNKVV, Khargone	1631	49	Madhya Pradesh	Tolerant to ELS and LLS; drought tolerant; recommended for <i>kharif</i> season
Kadiri 9	2009	ANGRAU, Kadiri	2500-3000	52	Andhra Pradesh	Tolerant of thrips, jassids, and nematodes. Tolerant to late leaf spot, rust, dry root rot and collar rot. Recommended for <i>kharif</i> season
Greeshma	2009	ANGRAU, Tirupati	2000-2500 (R); 4000-4700 (I)	49	Andhra Pradesh	Tolerant to LLS, drought, high temperature and aflatoxin; recommended for <i>kharif</i> and <i>rabi</i> -summer season

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
Kadiri 7	2009	ANGRAU, Kadiri	1643	47	Andhra Pradesh	Tolerant to sucking pests and leaf spots; bold seeded (HSM =65-75 g); recommended for <i>kharif</i> season
Kadiri 8	2009	ANGRAU, Kadiri	1523	47	Andhra Pradesh	Tolerant to sucking pests and leaf spots; bold seeded (HSM = 65-75 g)
Mallika (ICHG 00440)	2009	RAU, Hanumangarh	2579	48	All India	Resistant to collar rot and PBNB; bold seeded (HSM=73g), recommended for <i>kharif</i> season
TGLPS 3 (TDG-39)	2009	UAS, Dharwad	2500-3000	-	Karnataka	-
JSP-39	2009	UAS, Dharwad	3000	49	AP, Karnataka, TN, Maharashtra	Tolerant to foliar diseases and root rot.
JL 501	2010	MPKV, Jalgaon	1661	48	Gujarat and southern Rajasthan	Suitable for early as well as late sown rainfed condition
Vijetha (R 2001-2)	2010	UAS,Raichur	1600	47	West Bengal, Orissa and Jharkhand ii) Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu	Resistant to PBNB; recommended for <i>rabi</i> -summer season
HNG 69	2010	RAU, Hanumangarh	2800	50	Uttar Pradesh, Punjab, northern Rajasthan	Tolerant to collar rot, stem rot and ELS; recommended for <i>kharif</i> season
Girnar 3 (PBS 12160)	2010	DGR, Junagadh	1520	45	West Bengal, Orissa, Manipur	Tolerant to leaf miner and thrips; recommended for <i>kharif</i> season
Kadiri Haritandhra (K 1319)	2010	ANGRAU, Kadiri	3728	48	Karnataka and Maharashtra	Multiple diseases and insect pests resistant, possess fresh seed dormancy upto 20 days; recommended for <i>rabi</i> -summer season

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
VL-Moongphali-1	2010	VPKAS, Almora	1940	42.2	Uttarakhand (Kharif)	Resistant to LLS and root rot diseases. (State release)
GPBD-5	2010	UAS, Dharwad	1500	46.0	Jharkhanad and Manipur (K)	Resistant to LLS and rust.
GJG-HPS-1 (JSP-HPS-44)	2010	JAU, Junagadh	2120	49.0	Gujarat (Kharif)	Rose colour seed.
Phule vyas (JL-220)	2010	MPKV, Jalgaon	2000	52	Maharashtra	Early maturing, High oil content.
Bheema	2010	RARS, Tirupati	3500-5000	45	Andhra Pradesh	Suited to Kharif and rabi regions
Rohini	2010	RARS, Tirupati	3700-4000	50	Andhra Pradesh	Suited to Kharif and rabi areas. Tolerant to mid and end season.
Pratap Raj Mungphalli	2011	MAUT, Udaipur	1600-2200	48	Rajasthan	Moderately tolerant to ELS, LLS and PBNB, Suited for Kharif and Summer
ALG-06-320	2011	TNAU, Aliyarnagar	3500	49	Vidharbha & Southern M.P.	Suitable for rabi/summer
RG-510	2011	RAU, Durgapur	2600	49	Rajasthan & Punjab	Resistant to collar rot, stem rot, early leaf spot, rust and stem necrosis.
RG 425	2011	RAU, Durgapur	1800-3600	48	Rajasthan	Resistant to collar rot and tolerant to drought. Suitable for Kharif.
RHRG-6021	2011	MPKV, Rahuri	3800	51	Western Maharashtra	Resistant to rust, LIS and stem rot and spodoptera
Divya (CSMG-2003-19)	2011	CAUAST, Mainpuri	3000	49	Uttar Pradesh	Resistant to leaf spots and tolerant to BND.
HNG-123	2012	RAU, Hanumangadh	3000	49	Rajasthan, UP & Punjab	Virginia bunch variety, Tolerant collar rot, stem rot, LLS, Spodoptera
RARS-T-1	2011	ANGRAU, Tirupati	2500(K) 4000(R)	44	Andhra Pradesh	Kharif, Rabi-summer, Bold seeded pods
RARS-T-2	2011	ANGRAU, Tirupati	3734(K) 4200(R)	48	Andhra Pradesh	Kharif, Rabi-summer, Early maturity
ICGV-00350	2012	RARS, Tirupati	3000-4400	48	Tamil Nadu & Andhra Pradesh	Tolerant to LLS, rust, stem rot, High fodder value.

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Variety	Year of release	Releasing centre	Yield Potential (Kg/ha)	Oil content (%)	Recommended for (state/region)	Specific features
CO-6	2012	TNAU, Coimbatore	1914	50-51	Tamil Nadu	Kharif, Resistant to LLS & Rust
GJG-31 (J-71)	2012	JAU, Junagadh	1632	49	Gujarat	Tolerant to stem rot, Free from PBNB, Suitable for Summer.
GJG-9 (J69)	2012	JAU, Junagadh	3483	49	Gujarat	Suitable for Summer, tolerant to stem rot.
GJG-22 (JSSP 36)	2013	JAU, Junagadh	1770	52	Gujarat	Suited to Kharif, semi spreading groundnut area. Tolerant to collar rot.
GJG-17 (JSP-48)	2013	JAU, Junagadh	1798	48	Gujarat	Suitable for Kharif, spreading groundnut area. Tolerant to stem rot
Dharani (TCGS-1043)	2013	ANGRAU, Tirupati	1887 Kharif 2666 Summer	52	Andhra Pradesh	Drought tolerant
Raj Mungphali-2	2015	MAUT, Udaipur	1480	46	Rajasthan	Resistant to LLS, dry root rot and rust
GJG-18 (JSP-49)	2015	JAU, Junagarh	1450	48	Odisha, West Bengal, Jharkhand, Manipur	-