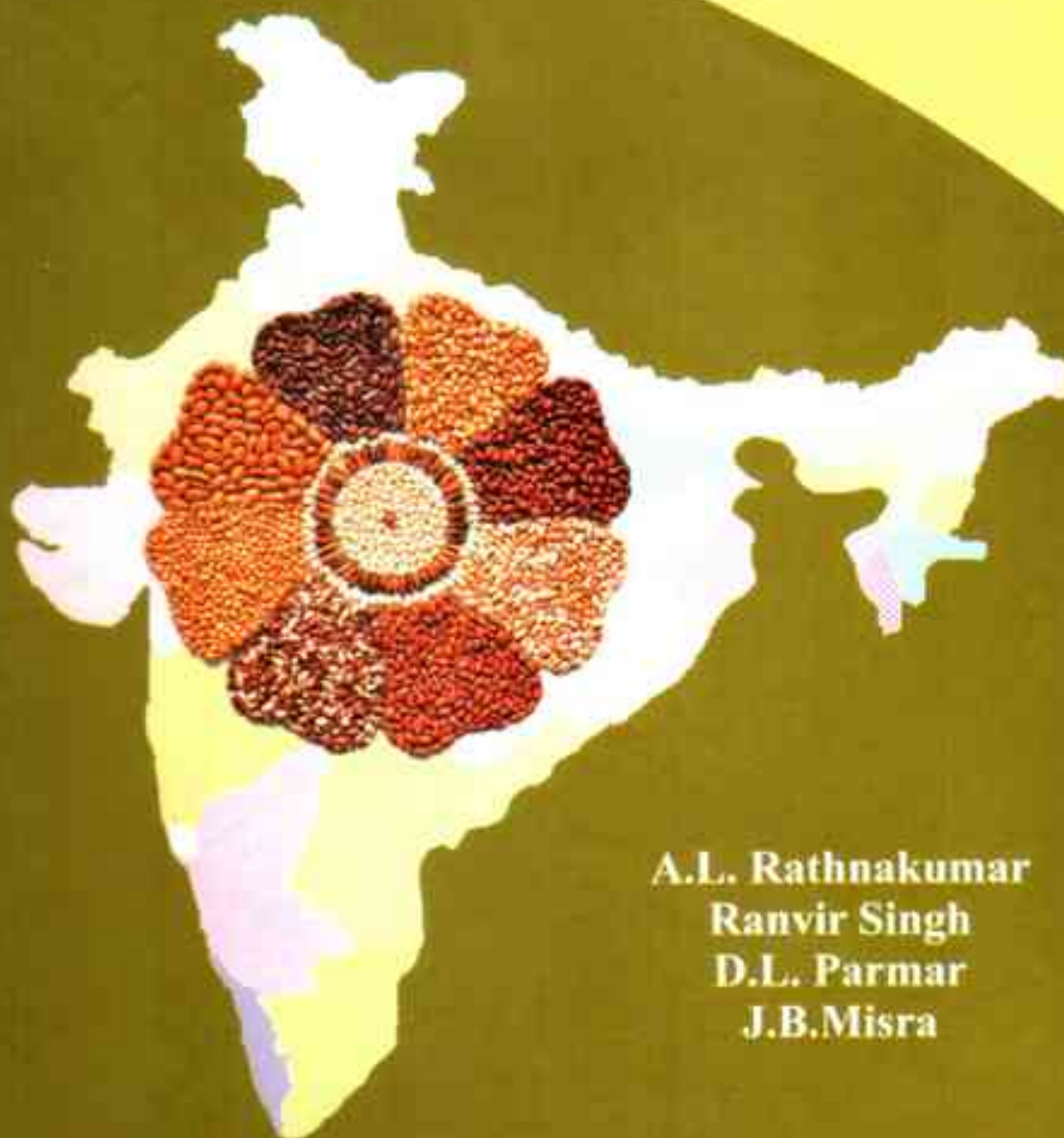


GROUNDNUT: A CROP PROFILE AND COMPENDIUM OF VARIETIES NOTIFIED IN INDIA



**A.L. Rathnakumar
Ranvir Singh
D.L. Parmar
J.B. Misra**



**Directorate of Groundnut Research
(Indian Council of Agricultural Research)**

P.B.No.5, Junagadh-362 001 Gujarat, India

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**A.L. Rathnakumar
Ranvir Singh
D.L. Parmar
J.B.Misra**



Directorate of Groundnut Research
P.B.No.5, Junagadh-362 001
Gujarat

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प्रो. स्वपन कुमार दत्ता
उपमहाविदेशक (फसल विज्ञान)

Prof. Swapan Kumar Datta,
Deputy Director General (Crop Science)



भारतीय कृषि अनुसंधान परिषद

कृषि भवन, डॉ. राजेन्द्र प्रसाद मार्ग, नई दिल्ली-110114

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Krishi Bhavan, Dr. Rajendra Prasad Road, New Delhi 110 014.

Foreword

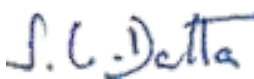
Groundnut is an important oilseed crop of India. The crop occupied 5.3 million ha (*kharif* and *rabi*-summer) in the year 2011-12 with a production of 6.9 million tonnes and productivity of 1323 kg/ha. Groundnut accounts for 22% of the cropped area under the oilseeds, 24% to the total production and 30% of domestic edible-oil supply. Most of the groundnut production in India is concentrated in six states viz. Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra and Rajasthan. The remaining groundnut producing areas are scattered in the states of Madhya Pradesh, Chhatisgarh, Uttar Pradesh, Punjab, Orissa and West Bengal.

Although the crop can be grown in all the seasons, it is grown mainly in rainy season (*Kharif*; June-September) under rainfed conditions. The *kharif* season accounts for about 80% of the total groundnut production. In the southern (Tamil Nadu, Andhra Pradesh) and southeastern regions (coastal Andhra Pradesh, Orissa, West Bengal) groundnut is grown also in rice-fallows during post-rainy season (*Rabi*: October to March). If irrigation facilities are available, groundnut can be grown during January to May as a spring or summer crop (in parts of Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, and Karnataka). The productivity of *rabi*-summer groundnut is much higher (about 1600 kg/ha) and stable than that of *kharif* (1200 kg/ha) crop.

The average productivity of groundnut in India was around 700 kg/ha just after independence, and at present, it is about 1300 kg/ha as against the world average of 1774 kg/ha. Although there is a considerable decrease in groundnut area over the years, the production and productivity has gone up. The major reason for increase in production and productivity of groundnut even under the rainfed cultivation has been due mainly to the release of niche-specific varieties coupled with development of suitable improved agro-production and protection technologies.

Prior to 1970, only 25 varieties were released in the country. With the establishment of 'All India Coordinated Research Project on oilseeds (AICPRPO)' in 1967 and subsequently with the establishment of a separate project for groundnut (AICRP-Groundnut) in 1992, as many as 169 stress tolerant and agronomically superior varieties have been bred and notified in the country raising the total to 194. However, a comprehensive record of all the varieties of groundnut developed and notified in India is absent.

This publication, "Groundnut: a crop profile and compendium of notified varieties varieties of India" is a timely effort by Dr. J.B. Misra, Director, Directorate of Groundnut Research, Junagadh and his team, which will not only serve as a reference material for all those involved in groundnut improvement work in the country but also help to claim our legitimate right on the country's genetic wealth in future.


(Swapan Kumar Datta)

डॉ. बी.बी. सिंह

सहायक महानिदेशक (तिलहन एवं दलहन)

Dr. B. B. Singh

Assistant Director General (OP)



भारतीय कृषि अनुसंधान परिषद

कृषि भवन, डॉ. राजेन्द्र प्रसाद मार्ग, नई दिल्ली-110114

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

Krishi Bhavan, Dr. Rajendra Prasad Road, New Delhi 110 014.



Message

Groundnut, 'the unpredictable legume' is the 13th most important food crop and 4th most important oilseed crop of the world. In India, the crop is grown on about six million hectare with a production of about seven million tonnes next only to soyabean and rape-seed mustard. Groundnut accounts for 22% of the area and about 25% of the total national production of all the oilseeds continues to be an important oilseed and ancillary food crop of India.

Although the crop was introduced to India in 16th century, systematic efforts to breed new varieties commenced only during the beginning of the last century. In a span of about one century, a total of 194 groundnut varieties have been released by various states (141 varieties) and the central through All India Coordinated Research Project on Groundnut (53 varieties) to suit various agro-ecological situations/niches. The spread of the crop from southern peninsular states to western, northern, and north-eastern states speaks of its remarkable adaptability. Its multiple use such as 'oil-feed-food' makes groundnut as an important crop to reckon with.

It is highly gratifying to note that the authors have collected information from several formal and informal sources covering history of development of groundnut varieties right from their introduction in India, their spread in various parts of country, to early efforts of breeding of new varieties and subsequent series of notification of varieties year after year. Thus, for the first time in a single cover, a comprehensive information on the salient features of groundnut varieties in India is now available. The compendium will go a long way in protecting the Indian interests especially in the era of intellectual property rights. I complement the authors for their efforts in bringing out this publications. This publication, I am sure, will serve as a useful resource for all the stakeholders of groundnut in the country and elsewhere.

(B.B.Singh)

PREFACE

Groundnut is the choice oilseed-food-feed-fodder crop especially among the small and medium farmers of the semi-arid tropical region of the world. Groundnut was introduced in to India during the first half of the sixteenth century. The crop has adapted itself very well and its cultivation is now wide spread throughout the country- from the peninsular region in the south to even foot hills of Kashmir in the north and from Gujarat in the west to Orissa and West Bengal in the east and even further in the NEH region.

In India, so far as many as 194 varieties have been released notwithstanding that South American continent is its homeland of groundnut and that the research on groundnut breeding and improvement is only about a century old in India. More than 20 public institutions representing 14 states are currently engaged on research on this crop and have come out with several high-yielding and stress-tolerant varieties for cultivation in various regions of the country where groundnut is grown. Since groundnut is a high-volume and low-value crop, contribution of private sector in groundnut research and development has well-nigh been none.

Although, earlier a few monographs on groundnut have been published in India, a systematic account of introduction of groundnut, its spread in India and also the initiation of efforts for breeding new varieties at various centres till their release and notification in the country was lacking. With a view to bridging this gap, this book "Groundnut: A Crop Profile and Compendium of Notified Varieties of India" has been compiled. Indeed, this required enormous efforts to collect numerous facts and information from various sources and then to compile the information so gathered into a single volume. It is not feasible to cite or acknowledge all the sources of information yet the important ones have been cited to help the readers desirous of gaining in-depth information.

For each variety, besides the information comprising the progenitor centre, recommended agro-climatic region/state, season for cultivation, a certain salient features, and reaction to pests and diseases, the traits of commercial importance, *viz.*, pod and kernel yields, shelling outturn, seed size and oil content etc. have also been given in this compendium.

While collecting the entire information, it was revealed that during the pre-independence era, tremendous research efforts, though unorganized, have gone in for improving an introduced crop like groundnut. Every single germplasm and cultivar was required to be imported and meticulously evaluated for development of niche specific varieties. Subsequently, organized efforts, initially through All India Coordinated Research Project on Oilseeds and later through All India Coordinated Research Project on Groundnut, made by various dedicated scientists as also by the research managers, provided the much needed impetus to research in this direction. This book, in a way, is a reflection and appreciation of all the research efforts made by such scientists committed to the cause of groundnut improvement.

The authors hope that this compendium would serve as a handy reference book to gain information on Indian groundnut varieties and thus be quite useful to researchers, extension workers, seed agencies, administrators and the students alike.

Authors

Contents

1. Introduction	1-5
2. Botany and Ecology	6-10
3. History, Spread and Development of Groundnut Varieties in India	11-15
4. Pioneering States and Institutions Fostering Groundnut Varietal Development in India	16-20
5. Notification and National Identity Numbers	21-27
6. Groundnut Breeding and Varietal Development	28-33
7. Habit Group-wise Information on Varieties Released	
a. Spanish Bunch	34-70
b. Valencia	71-72
c. Virginia Bunch	73-89
d. Virginia Runner	90-100
References	101-103
Annexures	104-118

List of Tables

Table No.	Details	Page No.
1a	Chemical composition of groundnut seed	1
1b	Nutritional values of groundnut seed (kernel)	1
1c	Fatty acid composition (%), oleic/linoleic ratio and iodine value of groundnut genotypes differing in habit groups	2
2	Triennial average (2009-10 to 2011-12) of area, production and yield of major groundnut producing countries	2
3	Quinquennial (2007-08 to 2011-12) average area, production and productivity of groundnut in major states of India	3
4	Agro-climatic zones of groundnut	3
5a	Agro-climatic zones and AICRP-G centres for <i>kharif</i> groundnut	4
5b	Agro-climatic zones and AICRP-G centres for <i>rabi</i> -summer groundnut	4
6	Details of market types of HPS grade groundnuts (kernels)	5
7	Export of groundnut from India	5
8	Taxonomy of groundnut	7
9	Taxonomic sub-divisions of <i>Arachis hypogaea</i> L.	9
10	Attributes of old groundnut varieties cultivated in different states of India from 1900-1940	14-15
11	Institution-wise account of release of varieties	19-20
12	List of groundnut varieties released in India and their national identity and notification numbers	22-27
13	Breeding methods employed for developing groundnut varieties in India	29

1. Introduction

Groundnut (*Arachis hypogaea* L.) is an annual legume and is also known as peanut, earthnut, goober pea, goober, pindas, jack nut, manila nut, pygmy nut, pignut, and monkey nut. The term monkey nut is often used to mean the entire pod. Groundnut seeds (kernels) contain 35.8- 54.2% oil (Jambunathan *et al.* 1985), 16.2-36.0% protein (Dwivedi *et al.* 1990), and 10-20% carbohydrate (Salunkhe *et al.* 1992). The seeds are also a good source of minerals like calcium, phosphorus and iron and vitamins like E, niacin, folacin, riboflavin and thiamine. Groundnut haulms constitute nutritious fodder for livestock. They contain protein (8-15%), lipids (1-3%), minerals (9-17%), and carbohydrate (38-45%) at levels higher than those of the cereal fodders. The digestibility of nutrients in groundnut haulm is around 53% and that of crude protein is 88% in animals (Nagaraj, 1988). Composition of nutrients in different parts of the groundnut seed and the nutritional value are provided in Table 1a and 1b.

Groundnut kernels are consumed directly as raw, roasted or boiled or used for oil extraction. Groundnut is used for culinary purposes and also for a host of other purposes. Groundnut and its products are also used as an animal feed (seeds, oil pressings, and green and dried haulms) and industrial raw material (oil and de-oiled cakes). After harvest the roots left behind in the soil add valuable nutrients to the soil. These multiple uses of groundnut plant make it an excellent crop for domestic markets as well as for foreign trade in several developing and developed countries.

Table 1a. Chemical composition of various parts of groundnut seed (g/100 g)

Constituents	Testa	Embryo axis	Kernels
Moisture	9.0	-	3.9-13.2
Protein	11.0-13.4	26.5-27.8	21.4-36.4
Fat	0.5-1.9	39.4-43.0	35.8-54.2
Total carbohydrate	48.3-52.2	-	6.0-24.9
Reducing sugar	1.0-1.2	7.9	0.1-0.4
Sucrose	-	12.0	1.9-6.4
Starch	-	-	0.9-5.3
Crude fibre	21.4-34.9	1.6-1.8	1.6-1.9
Ash	1.9-4.6	1.9-3.2	1.8-3.1

Source: Cobb and Johnson (1973)

Table 1b. Nutritional values of groundnut seed (kernel)

Nutrients	Content in 100 g of seed	
	Raw	Roasted
Calories	564	582
Protein (g)	26	26
Fat (g)	47.5	48.7
Calcium (mg)	69	72
Iron (mg)	2.1	2.2
Thiamine (B1) (mg)	1.1	0.3
Riboflavin (B2) (mg)	0.13	0.13
Niacin (mg)	17.2	17.2

Source: Burn and Huffmann (1975)

Table 1c. Fatty acid composition (%), oleic/linoleic ratio and iodine value of oil of groundnut genotypes differing in habit groups

Fatty acid	Virginia runner		Virginia bunch		Spanish bunch	
	Range	Mean	Range	Mean	Range	Mean
Palmitic (16:0)	8.54 -10.77	9.61	9.25 -12.12	10.54	9.41 -12.61	11.48
Stearic (18:0)	2.03 -3.14	2.63	1.55 -3.41	2.42	1.74 -5.00	3.40
Oleic (18:1)	50.55 -54.69	52.18	37.64 -49.13	43.42	36.30 -49.70	41.89
Linoleic (18:2)	29.70 -33.37	31.96	33.82 -46.65	39.68	29.96 -44.32	39.64
Arachidic (20:0)	0.17 -0.53	0.31	0.19 -0.79	0.34	0.19 -0.80	0.40
Eicosenoic (20:1)	0.51 -1.06	0.83	0.57 -1.19	0.88	0.33 -0.97	0.62
Behenic (22:0)	1.50 -2.89	2.37	1.05 -4.10	2.77	1.32 -4.04	2.67
Oleic/Linoleic	1.53 -1.83	1.64	0.82 -1.45	1.11	0.83 -1.53	1.09
Iodine value	99.20 -100.90	100.90	101.50 -114.20	106.40	93.70 -111.20	105.20

Source: Raheja *et al.* (1987)

The crop is cultivated in more than 100 countries in six continents mostly in tropical countries between 40 °N to 40 °S latitudes. It is grown globally in an area of 22 million hectares with a total production of 38 million tons and a yield of 1,774 kg/ha of pod in the year 2011-12 (FAOSTAT 2012). Production is concentrated (90% of global groundnut area) in Asia and Africa in the semi-arid regions (SAT) where small farmers grow the crop under rain-fed conditions with limited or no inputs.

Major groundnut growing countries are India (19%), China (22%), Nigeria (11%), and the USA (2.0%). Globally, China (42%) and India (18%) are the largest producers followed by Nigeria (7.7%), the USA (4.3%) and Indonesia (1.8%). The triennial average area, production and yield in different countries during 2009-10 to 2011-12 are provided in Table 2.

Table 2. Triennial average (2009-10 to 2011-12) of area, production and yield of major groundnut producing countries

Country	Area (lakh ha)	Production (lakh tones)	Yield (kg/ha)
China	44.04	149.38	3390
India	55.20	61.06	1105
Nigeria	25.36	28.26	1119
USA	5.17	19.67	3796
Myanmar	8.40	13.36	1590
Senegal	10.30	10.16	975
Indonesia	6.43	7.76	1240
Niger	6.86	3.22	466
World	240.05	375.11	1562

Source: FAOSTAT 2012

In India, groundnut accounts for about 22% of area (5.86 million ha) and 25% (8.26 million tons) of production of total oil seeds (DAC, 2012). Groundnut production in India is mostly concentrated in six states, viz., Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra and Rajasthan (Table 3). These six states account for about 90% of the total groundnut area. The remaining areas are scattered in the states of Madhya Pradesh, Uttar Pradesh, Punjab, Odisha and West Bengal. (The state-wise area, production and productivity in the last five years are provided in Annexure I)

About 75% of cropped area of groundnut in India lies in a low to moderate rainfall areas (parts of peninsular region and western and central regions), with a short period of distribution. Based on rainfall pattern, soil factors, diseases and pest situations, groundnut growing areas in India have been divided into five agro-climatic zones (Table 4). The zone-wise location of various All India Coordinated Research Project on Groundnut (AICRP-G) centers for *kharif* and *rabi*-summer seasons are shown in Table 5a and Table 5b, respectively.

Table 3. Quinquennial (2007-08 to 2011-12) average of area, production and productivity in six major groundnut growing states of India

State		Kharif	Rabi -summer	Total
Gujarat	A	16.81	1.35	18.17
	P	25.13	2.48	27.61
	Y	1502	1829	1522
Andhra Pradesh	A	12. 83	2.75	15.58
	P	9.47	5.46	14.93
	Y	691	1981	930
Tamil Nadu	A	2.93	1.61	4.54
	P	5.19	4.73	9.93
	Y	1807	3078	2227
Karnataka	A	6.37	1.76	8.13
	P	4.44	1.56	6.00
	Y	692	887	735
Maharashtra	A	2.71	0.74	3.45
	P	3.00	1.06	4.06
	Y	1102	1443	1174
Rajast han	A	3.37	0.03	3.38
	P	5.70	0.05	5.71
	Y	1676	1370	1675
All India	A	48.91	9.31	58.22
	P	57.24	17.11	74.35
	Y	1164	1839	1273

A=Area (lakh ha); P=Production (lakh tons); Y=Yield (kg/ha)

Table 4. Agro-climatic zones of groundnut

Zone	Rainfall (mm)	Soil type	Temp (°C)		Relative humidity (%)	Crop duration (days)	Pest and diseases
			Min.	Max.			
Zone I Rajasthan, Haryana, Punjab, Uttar Pradesh	466-478	Sandy to sandy loam (saline-alkaline soils in some cases)	12	38	57 - 88	120 -150	White grub, termites, collar rot, stem rot and leaf-spots
Zone II Gujarat, southern Rajasthan	547-866	Medium black (calcareous; low soil depth)	19	35	76 - 94	115 -130	Thrips, jassids <i>Spodoptera</i> , collar rot, stem rot and leaf-spots
Zone III Northern Maharashtra, Madhya Pradesh	610-939	Medium black to loamy (neutral soil with good depth)	16	37	65 - 90	100 -110	Rust, leaf-spots, <i>Spodoptera</i> , <i>Helicoverpa</i> , thrips and jassids
Zone IV Jharkhand, West Bengal, Odisha, North Eastern, Hill region	747-1268	Alluvium, sandy loam to clay-loam (mostly acidic)	14	34	78 - 92	110- 120	Aphids, thrips, rust, leaf-spots and pod rot
Zone V Southern Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu	455-900	Red-lateritic to sandy-loam (high alumina content forms hard crusts)	15	31	68 - 95	95 -120	Rust, leaf-spots, dry root rot, stem rot, leaf miner, <i>Spodoptera</i> and termites

Table 5a. Agro-climatic zones and AICRP-G centers for *kharif* groundnut

Zone	Centres
Zone I	Mainpuri, Hanumangarh, Durgapura, Ludhiana*
Zone II	Junagadh, Amreli*, Talod*, Udaipur, Pratapgarh*
Zone III	Khargone, Jalgaon, Akola*, Shirgaon (Ratnagiri)
Zone IV	Kanke, Bhubaneswar, Mohanpur, Imphal
Zone V	Vriddhachalam, Aliyarnagar, Tindivanam* Jagtial, Kadiri, Tirupati*, Dharwad, Raichur, Chinthamani, Latur*

*Voluntary centre

Table 5b. Agro-climatic zones and AICRP-G centers for *rabi*-summer groundnut

Zone	Centres
Zone I (Spring)	Mainpuri, Modipuram*, Ludhiana*
Zone II (Summer zone)	Junagadh, Vyara, Anand*, Akola*, Jalgaon
Zone IIIa (Summer zone)	Dharwad, Raichur, Chinthamani, Shirgaon (Ratnagiri), Rahuri
Zone IIIb (Rabi zone)	Aliyarnagar, Bhavanisagar, Vriddhachalam, Tindivanam*, Kadiri, Jagtial, Tirupati*
Zone IV (Rabi zone)	Bhubaneswar, Badachana*, Mohanpur

*Voluntary centre

Although the crop can be grown throughout the year, it is grown mainly in rainy season (*kharif*; June-September). The *kharif* season accounts for about 80% of the total area and production. In the southern (Tamil Nadu, Andhra Pradesh) and southeastern parts (coastal Andhra Pradesh, Odisha, West Bengal) of India, groundnut is also grown in rice fallows during post-rainy season (*rabi*; October to March). If irrigation facilities are available, groundnut can be grown from January to May as a summer (Gujarat, Maharashtra, Karnataka) or spring crop (parts of Uttar Pradesh and Punjab). Groundnut is also grown in different cropping systems like sequential, multiple, and intercropping with an array of field (sorghum, maize, bajra, pigeon pea, green gram, black gram) and commercial/plantation (cotton, sugarcane, coconut) crops.

India has the largest area under groundnut in the world but the productivity of groundnut has been rather low (1,323 kg/ha; DAC, 2012) when compared with the world (1,774 kg/ha). However, the productivity of *rabi*-summer groundnut in India is high (1,938 kg/ha) and stable compared to that of *kharif* (1,188 kg/ha) crop (DAC, 2012). Variations in rain-fall cause major fluctuations in groundnut production in India. Because groundnut is grown mainly as a rain-fed crop, there is a high level of fluctuation both in the area and production depending on the rainfall pattern. The productivity is restricted by drought, low inputs by small holders and marginal farmers in dry land areas, high incidence of soil borne (collar rot; stem rot), foliar fungal (rust; early leaf spot (ELS); late leaf spot (LLS) and virus (peanut bud necrosis, PBND; peanut stem necrosis, PSND) diseases and attack by certain insect-pests (*Spodoptera*, *Helicoverpa*, leaf miner, thrips, jassids).

Groundnut is the 13th most important food crop and 4th most important oilseed crop of the world. About 50% of total global production of groundnut is crushed for extraction of oil for human consumption and industrial uses, about 35% is used for food or confectionery purposes, and the remaining 15% is used as seed and animal feed (Birthal *et al.* 2010). While in India, about 81% of the total groundnut produced was used for oil extraction, 12% for seed 6% for direct consumption, and 1% for export trade (Reddy, 1988).

Currently, the world trade of edible groundnut is around 1.25 million metric tons. The United States of America is one of the world's leading groundnut exporters, with average annual exports ranging between 0.15 and 0.20 million metric tons. Argentina and China are the other major exporters. Countries such as Vietnam and several African countries periodically enter the world market depending upon their crop quality and world market demand.

European Union is the major importer of groundnut oil and groundnuts (both with and without shells); the value of imports in 2010 was about 254 million USD (FAOSTAT 2012). During the same period, Argentina stood first among the groundnut oil exporting countries with a value of 80 million USD.

Around the world several value-added products have been developed from groundnut, viz., peanut flour, roasted peanuts (in-shell), boiled peanuts (in-shell), roasted and salted peanuts (kernels), peanut butter, peanut candy, etc., which have a number of applications including bakery, confectionery and general consumer market. In India, the “Hand Picked and Selected” (HPS) groundnuts, used mainly for food purposes, are high-value and premium-priced item in the world market and enjoy excellent demand world over. The market types, which are exported to different countries, are 'Bolds' or 'Runners', Java or Spanish and Red Natsals. The commercial specifications of these varieties are provided in Table 6.

Table 6. Details of market types of HPS grade groundnuts (kernels)

Type	Counts per ounce	Specifications
Bold	35/40, 38/42, 40/45, 45/50, 45/55, 60/70, 70/80	Moisture content: 7% maximum; aflatoxin B ₁ : 2 ppb maximum; and aflatoxin total: 4 ppb maximum for EU
Java	40/50, 45/55, 60/70, 70/80, 80/90, 100/120, 120/140, 140/160, 160/180	
Red skin Java	70/80, 80/90	

Source: www.agrocrops.com

Though, India remains the second largest producer of groundnut in the world, its contribution in the world trade of edible groundnut has been dwindling compared to other regions of the world. Until mid-1970s, India was one of the prominent exporters of edible groundnut to many countries. During 1979-80, India's groundnut exports were of 12,000 tons and the foreign exchange earnings were of Rs. 91 millions. During 2011-12, India has become the top exporter of groundnut (8.53 lakh metric tons of value Rs. 5250 crores followed by China (DGCIS, FAOSTAT 2012). However, the aflatoxin contamination in the produce (in kernels and meal) and the stringent quality standards imposed by European Union (EU) pose a great threat to the export of edible groundnuts. The figures for exports of groundnut from India in the past five years is given in Table 7. The figures for export by different countries in the last three years are given in Annexure II.

Table 7. Export of groundnut from India

Year	Quantity (tons)	Value (Rs crores)
2006 -07	251429	799
2007 -08	268156	1042
2008 -09	297890	1239
2009 -10	340243	1426
2010 -11	433751	2178
2011 -12	853084	5250

(Source: DGCIS)

The strength of India however, lies in irrigated production system of *rabi*-summer season with high input and management conditions. A few promising large-seeded confectionery-grade varieties having hundred seed mass more than 70 g with nutty flavour have also been developed and released recently. Through good agricultural practices, proper pre- and post-harvest management practices and hygienic storage conditions, the international edible groundnuts trade can be boosted further.

2. Botany and Ecology

Groundnut is a species of the legume family Fabaceae (the taxonomy of groundnut is given in Table 8). It is an annual herbaceous plant, growing 30-50 cm tall. The leaves are tetrafoliolate, paripinnate, stipulate, borne spirally in a 2/5 phyllotaxy (two opposite pairs; no terminal leaflet); each leaflet is 2 to 8 cm long and 1 to 4 cm broad.

The inflorescence is 'modified sessile papilionaceous', 2-4 cm wide, borne on axils of leaves on primary or secondary branches, spike-like, simple or compound monopodia. Each node has up to five flowers. However, for each inflorescence, three flowers are most common and at any given time only one flower opens (Moss and Rao, 1995).

The flower (Figure 1) appear to be stalked due to presence of tubular 'hypanthium' or 'calyx tube'. The flower is subtended by a bract, with a second bract on the inflorescence branch. There are two calyx lobes an awn-like, the one opposite the keel (includes one sepal), and a broad one on the outer side of the standard (includes four fused sepals). The corolla comprises 5 petals (1 standard, 2 wings, and 2 keel). The standard petal is light yellow to deep orange or rarely white. A central crescent area exists on the face of the standard petal, which can be deeper in colour as that of standard or may be of a different colour. The wing is usually the same colour as the standard but the colour may vary with varieties. Stamens are 10, monodelphous, with the staminal column surrounding the ovary. Two of them are usually sterile. Of the remaining, 4 are globose and uniloculate and 4 are oblong, three are biloculate and the one opposite to standard is uniloculate. Filaments are fused for two-thirds of their length and form acute angles with their fused bases. Stigma is club-shaped or clavate usually at anther level or protruding slightly above. Stigma is club-shaped or clavate usually at anther level or protruding slightly above.

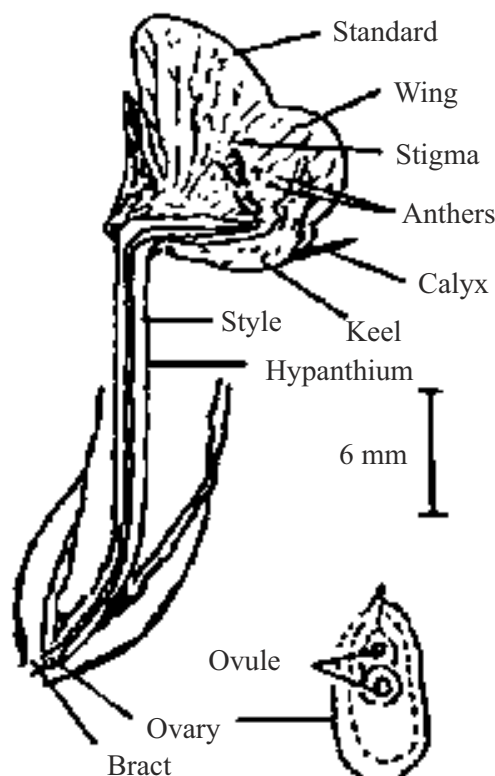


Figure 1. Parts of a groundnut flower

(Source: Cofflet, 1989)

A day before anthesis, the flower bud is 6-10 mm long. During day time the hypanthium elongates slowly and the buds grow to 10-20 mm long. The elongation is faster during nights and at the time of anthesis the buds are about 50-70 mm long. Flower buds generally open at dawn; it may be delayed due to cold or wet weather. The dehiscence of anthers takes place 7-8 hours before the flower opening or some times even a shorter gap. The stigma is reported to be receptive from 24 hours before to 12 hours after the opening of the flower, but generally it is receptive only a few hours before anthesis. The pollen tube grows at the rate of about 1 cm per hour resulting in fertilization 5-6 hours after pollination. As the stigma and anthers are enclosed in the keel, self pollination is the rule. Natural cross-pollination has also been reported ranging up to 6% (Hammons and Leuck, 1966; Culp *et al.* 1968).

After pollination, the ovary at the base of the calyx tube starts growing within a week by the activation of the intercalary meristem located just below it. The green ovary becomes purplish from tip downwards. The developing ovary, pierces through the floral parts to reveal an elongating peg, a green stalk-like structure, which is botanically a 'carophore' or 'gynophore' and this peg carrying the ovary at its tip then starts growing (elongating) geotropically. After entering the soil to a certain depth, the peg becomes diageotropic and then ceases to elongate. The diageotropism is such that the ovules are always located on the upper wall of the pod with the pod tip pointing away from the plant. The fruit, botanically a pod (lomentiform carpel), develops into a 3 to 7 cm long structure containing 1 to 4 seeds which matures underground.

Table 8. Taxonomy of groundnut

Kingdom	<i>Plantae</i>
Division	<i>Tracheophyta</i>
Class	<i>Magnoliophyta</i>
Order	<i>Fabales</i>
Family	<i>Leguminosae</i>
Subfamily	<i>Faboideae</i>
Tribe	<i>Aeschynomeneae</i>
Sub tribe	<i>Stylosanthenae</i>
Genus	<i>Arachis</i>
Species	<i>hypogaea</i>

Origin and classification of varieties

The cultivated groundnut (*Arachis hypogaea* L.) is a tetraploid (amphidiploid or allotetraploid) with a chromosome number $2n=4x=40$. The genome has two sets of chromosomes from two different species, thought to be *A.duranensis* and *A.ipaensis*, which are believed to have combined to form a tetraploid species, *A.monticola*, which eventually gave rise to the domesticated groundnut, *A.hypogaea* (Krapovickas, 1973).

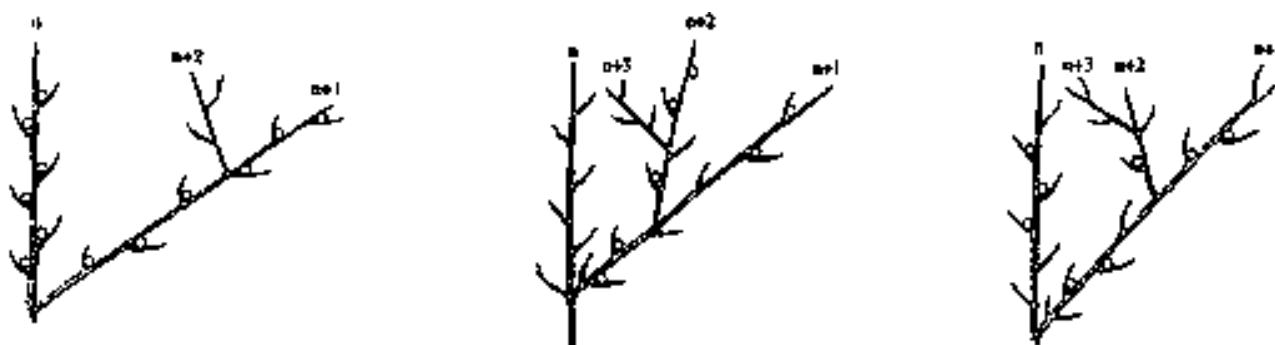
Arachis hypogaea L. is the only species cultivated worldwide for its seed and oil and is not known to occur in wild state. However, at least two other species have been cultivated for their seed. These are *A.villosulicarpa* (cultivated in northwestern Brazil) and *A.stenosperma* (cultivated in central and southwestern Brazil). Two other species, *A.glabrata* and *A.pintoi* are also being cultivated as forage plants in South America, North America and Australia, while the species *A.repens* is being used as a ground cover in south America.

The cultivated groundnut has been divided into two sub-species, distinguished primarily on the basis of branching pattern (Figure 2a) and distribution of vegetative and reproductive axes (Figure 2b). The subspecies '*hypogaea*' has two botanical varieties, '*hypogaea*' (spreading-Virginia runner and semi-spreading-Virginia bunch types) and '*hirsuta*' (Peruvian runner), whereas the subspecies '*fastigiata*' has four ('*fastigiata*'-valencia; '*vulgaris*'-Spanish bunch; '*peruviana*' and '*aequatoriana*') (Gregory, *et al.* 1973 and Krapovickas and Gregory, 1994).



1. Erect (Spanish bunch, Valencia types) 2. Semi-spreading (Virginia bunch) 3. Spreading (Virginia runner)

Figure 2a. Growth habit of different botanical varieties based on branching pattern



1. Sequential (Spanish, Valencia) 2. Alternate (Virginia runner, Virginia bunch) 3. Irregular (Intermediates)

Figure 2b. Arrangement of vegetative and reproductive axes on different branches
(Source : IBPGR, ICRISAT, 1985)

The subspecies *hypogaea* and *hirsuta* share several morphological features. The floral axes on main axis are absent and pairs of vegetative branches and floral axes alternate along lateral branches (Figure 2b). The Virginia type is less hairy, with short branches, whereas *hirsuta* type is more hairy with long branches. The Virginia runner and Peruvian runner varieties are prostrate and possess seed dormancy, and require 4-6 months growing season. The prostrate varieties are commonly called 'runners' or 'spreading' types as lateral branches remain close to the ground, giving a spreading appearance. The accessions of Peruvian runner, however, are very few in world germplasm collections.

While *fastigiata* and *vulgaris* types share some morphological features, in both of these, the floral axes are found on the main axis. There is a continuous run of multifloral axes along lateral branches. The 'Valencia type' is less branched whereas 'Spanish type' is more branched. The Valencia and Spanish varieties are erect, have non-dormant seeds, and mature in 3 to 4 months. Erect types are also called 'bunch types' as the upright growth of branches give mature plant a tightly bunched and bushy appearance.

Erect types often have smaller number of individual pods per plant than the prostrate types. However, the erect types tend to have slightly higher seed oil and seed protein contents. Spanish types are particularly rich in oil. The distinguishing morphological features among the botanical varieties are presented in Table 9.

Table 9. Taxonomic sub-divisions of *Arachis hypogaea* L.

Sub-species	Market type	Distinguishing characteristics
Sub-species: <i>hypogaea</i>		No floral axes on main stem; alternating pairs of floral and reproductive axes on branches; prostrate; branches short, less hairy; medium to late maturing
Variety: <i>hypogaea</i>	Virginia runner (Spreading)	Prostrate, profuse branching; less hairy; large-seeded
Variety: <i>hirsuta</i>	Peruvian runner	Limited branching; more hairy, small-seeded
Sub-species: <i>fastigiata</i>		Floral axes on main stem; continuous run of multifloral axes along lateral branches; upright growth habit
Variety: <i>fastigiata</i>	Valencia	Few long upright branches, hairy leaf; pods with 2 or 2-4 (rarely 5) seeds, beaked; reticulation prominent; testa-red, yellow, purple or variegated
Variety: <i>peruviana</i>	-	Less hairy; pods deeply reticulated
Variety: <i>aequatoriana</i>	-	Purple stem; more branched, erect; very hairy; pods deeply reticulated
Variety: <i>vulgaris</i>	Spanish bunch	More branched than Valencia; pods slightly reticulated, seeds mostly 2, salmon, red, purple or white testa

Ecology

The groundnut can be successfully cultivated between 35°S to 40°N latitudes, but it extends up to 45°N in central Asia and North America. It adapts to a wide range of environments. The crop is commercially grown below 1,250 m (MSL), although many varieties could be found at much higher elevations. Groundnut can grow very well in well-drained sandy loam soils as the light soils help in easy penetration of pegs and their development and harvesting of pods. The productivity of groundnut is high in soils with pH between 6.0-6.5.

Climatic conditions such as temperature and rainfall significantly influence groundnut production. Warm and moist conditions are highly congenial. Cool and wet climate delay the germination and seedling emergence, and thus enhance the risk of seed rot and seedling diseases.

Adequate and well-distributed rainfall during the growing season especially during flowering, pegging and pod formation stages, is essential for realising maximum yield and quality of groundnut. Groundnut is widely grown in areas receiving 600 to 1,500 mm of rainfall. However, the crop can be grown most profitably with a rainfall of about 1000 mm.

For successful cultivation of groundnut, the quantum of rainfall required at various stages of crop growth is:

- * 100 mm for pre-sowing operations (preparatory cultivation)
- * 150 mm for sowing, proper germination and a good crop stand
- * 400-500 mm for flowering and pod development

Temperature is a major environmental factor that determines the rate of crop development. Temperatures above 35°C inhibit the growth of groundnut. Optimum temperature for growth processes is between 25-30°C (Ketring *et al.* 1982) and the growth ceases at 15°C. For rapid emergence, soil temperature above 21°C is needed. The optimum temperature for the most rapid germination and seedling development is about 30°C; 28-30°C for proper vegetative growth; 25-28°C for flowering (Fortainer *et al.* 1957; Cox, 1979) and 23-26°C for pod formation and pod development (Willims *et al.* 1975). Temperatures between 25 and 30°C are optimum for plant development (Weiss, 2000). A minimum of 100-day optimum temperature in growing season is necessary for reaping a good harvest.

Groundnut is a day neutral plant (Fortainer, 1957; Summerfield and Roberts, 1985) and thus little affected by day length. However, studies have shown that pod yield is significantly influenced by day length (Ketring 1979; Witzemberger *et al.* 1988). It is now well established that long days promote vegetative growth at the expense of reproductive growth and increased crop growth rate, decreased partitioning of photosynthates to pods and decreased duration of effective pod filling phase (Ketring 1979, Witzemberger *et al.* 1988; Nigam *et al.* 1994 and 1998). At low light intensity, plant growth however is adversely affected.

3. History, Spread and Development of Groundnut Varieties in India

The groundnut plant is believed to have originated in the South American continent, primarily in the tropical areas of Peru. The archaeological records support its cultivation between 300 and 2500 BC in Peruvian desert oases (Weiss, 2000; Smith, 2002). Although no archaeological evidence of groundnut has been uncovered in this area due its tropical climate, the Gurarani region of Paraguay, eastern Bolivia, and central Bolivia showed the greatest diversity of wild *Arachis* species. The cultivated groundnut was likely first domesticated in the valleys of the Paraguay and Prarana rivers in the Chaco region of South America (Figure 3).

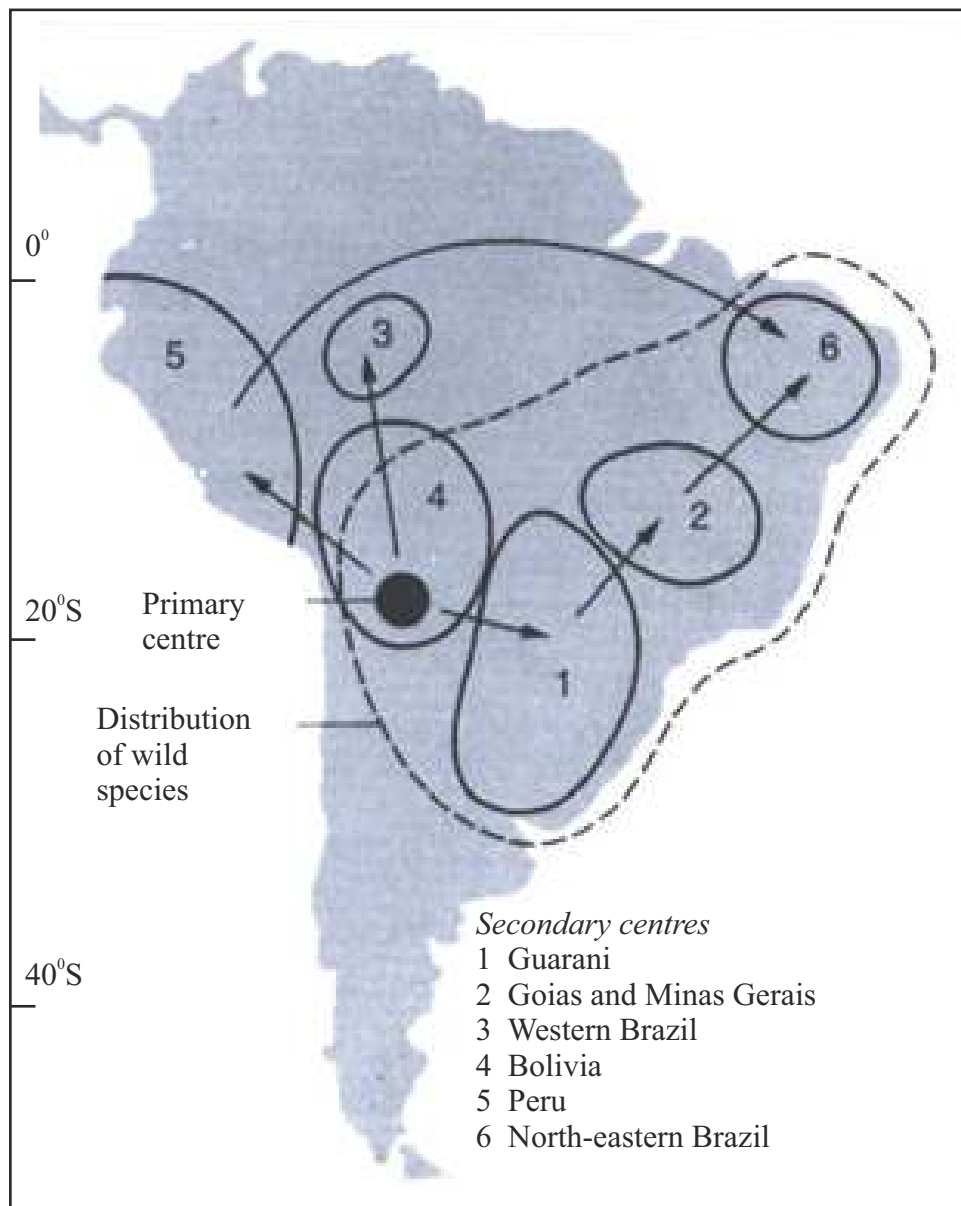


Figure 3: Centres of origin and diversity of *Arachis* species
(Source: Weiss, 2000)

Diffusion

Groundnut is widely distributed and has adapted itself in various countries of the world. Currently it is grown in about 100 countries between 40°N and 40°S. The diffusion of the crop to various countries can be traced along the dotted lines (Figure 4).

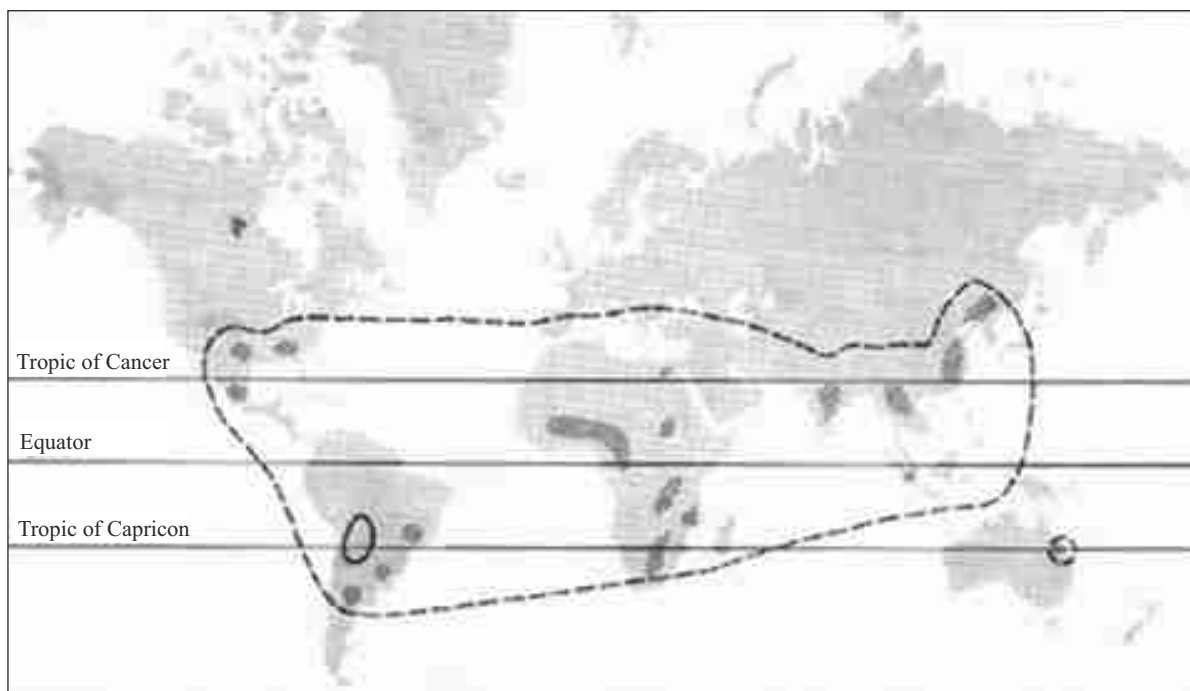


Figure 4. Centre of origin (solid line), area of intensive cultivation (dotted line) and areas of maximum cultivation (shaded) of groundnut in the world
(Source: Weiss, 2000)

Krapovickas (1969) provided a history of introduction of different botanical varieties since 1500 AD. The Spaniards, who explored the southern America, encountered this nut-like seed and soon after, the different varieties of groundnut started to spread around the world.

A type of variety named 'Virginia' was taken from the Antilles to Mexico around 1500 and then quickly introduced into West Africa. This variety was later introduced into eastern North America from both West Indies and West Africa in the 17th century. Then it moved to the other parts of North America.

The 'Peruvian variety' was taken to the Philippines by Spanish galleons and then to southeastern China before 1600, where it was known as 'foreign beans'. Subsequently, it spread throughout China and to Japan where it was known as 'Chinese beans'. Chinese settlers were probably responsible for introduction of this variety to the rest of southeast Asia and Indonesia.

The 'Spanish variety' was taken into Africa directly by the Portuguese explorers and there it got mixed with the 'Virginia variety' and produced a great diversity of African land races. The 'Spanish variety', evidently was introduced into Spain from Brazil via Lisbon in the late 18th century. From Spain it was introduced into southern France and finally into the USA in 1871.

The 'Valencia types' were probably introduced into Spain from Cordoba, Argentina around 1900 and were then introduced to the USA from Valencia during 1910. Groundnut did not reach England and France until long after Spanish and Portuguese had first encountered them.

Introduction of groundnut in India

Initially it was thought that groundnut arrived in India possibly from Africa, as one of the Indian names for groundnut was 'Mozambique bean'. Later, based on the affinity between the type grown in Asia (including India) and the Peruvian forms, it was confirmed that groundnut was introduced into India primarily by Spaniards (Krapovickas, 1969; Hammons, 1982). On the basis of a study of herbarium specimens, Badami (1936) found close resemblance between the variety, 'Indigenous' grown in Mysore and the varieties grown in South America, Philippines, China and Indonesia. Krapovickas (1969) finally concluded that the Peruvian type (variety *hirsuta*) was first transported along the American west coast to Mexico and then across pacific to the Philippines, from where it spread to China and India in addition to Malaysia and Indonesia.

The credit for the introduction of the crop into India goes to the Spanish missionaries who followed Vasco De Gama shortly after his first landing in India. It is likely that the groundnut plant was introduced into India as early as in the first half of the sixteenth century (John *et al.* 1955). In Buchanan-Hamilton's book, "Travels through Mysore", South Kanara and Malabar', written in 1800, the plant is referred to as being cultivated together with turmeric. In the Annual Land Revenue Report, 1850-51, of the collector of South Arcot in Tamil Nadu, it is referred to as "a crop that has already proved profitable on dry lands, the oil being in steady demand in European markets" (Seshadri, 1962). The extent of groundnut cultivation in that year was reported to be 4,000 acres (approx 1618 ha) and at that time, it was probably the largest area grown in any state in India. Since the area under groundnut was the largest in South Arcot district in mid-nineteenth century, it may be assumed that the introduction of groundnut crop occurred on the east coast of the then Madras state (comprising Tamil Nadu, Andhara Pradesh and Karnataka).

With the introduction of groundnut as an oilseed in the European markets, a stimulus for its cultivation was received around the world including India. The area under groundnut in the then Madras State began to expand even beyond the Madras State and reached more than 2.50 lakh acres (about 1.01 lakh hectares) by 1890. Watt (1908) mentioned that 1,12,000 acres were under groundnut in India in 1879, of which two-thirds was in the erstwhile Bombay state (Maharashtra and Gujarat). During 1896-97, the area, however, began to shrink as the so-called 'indigenous' variety was said to have deteriorated. According to Leiberherr (1928) there was shrinkage of area in Bombay state about the same time.

Towards the end of 19th century, improved varieties were introduced by various agencies into India from different sources. Messers Parry and Company introduced the variety 'Mauritius' from Mozambique (East Africa) in 1894 (Bensen, 1914). In 1901-02, the erstwhile Bombay Department of Agriculture introduced the varieties 'Mauritius' from Pondicherry; 'Spanish' and 'Virginia' from the United States and 'Small Japan' and 'Large Japan' from Japan (Kelkar, 1911). All these exotic introductions fared better than the indigenous stocks and subsequently replaced the latter. With the growing demand for groundnut and its products in foreign markets coupled with introduction, acclimatisation and improvement of exotic varieties undertaken by various state Departments of Agriculture, there was a phenomenal expansion in cultivation of groundnut crop in India (Seshadri, 1962).

Until 1900 'Guarani', a variety which matured in 195 days and required only 2-3 irrigations after the monsoon, was cultivated on a large-scale. During the next decade two varieties that could grow in rain-fed conditions 'Big Japan (a spreading variety)' and 'Spanish (an erect/bunch variety)' became popular. Thus, spreading, semi-spreading and bunch varieties with higher oil contents and maturing in 105-145 days, gained entry and reigned over various regions in the country.

Except for 'Spanish Improved', which was released in 1905, the information about the cultivars recommended for cultivation during the subsequent four decades (1900-1940) has not been documented well. The first attempt to compile the information on the recommended varieties was made by Ramamurthy in 1974. The compilation included 31 varieties (Table 10). In this compilation, the details of their years of release, pedigrees and the originating institutions, however, were not mentioned.

Table 10: Attributes of old groundnut varieties cultivated in different states of India from 1900-1940

S. No.	Variety	State for which recommended	Growth habit	Days to maturity	Pod yield (kg/ha)	Shelling outturn (%)	Oil (%)	Special features
1	'Big Japan'	Bihar	Spreading	140	1,850	74.0	49.0	Suitable for alluvial-loam soils
2	'Early runner'	Bihar	Semi-spreading	110	1,750	70.0	48.0	Suitable for red-loam soils
3	'15-C-3'	Bihar	Spreading	140	1,900	70.0	49.0	Suitable for alluvial-loam soils
4	'Ah-32'	Gujarat	Bunch	100	1,230	76.6	48.0	Suitable for heavy soils
5	'Ah-334'	Gujarat	Spreading	120	1,800	74.0	48.0	Suitable for heavy soils
6	'Spanish Improved'	Karnataka	Bunch	110	2,000 2,200	-	50.0	Suitable for irrigated conditions
7	'HG-8'	Karnataka	Bunch	110	1,000	75.0	50.0	Grown in the southern districts of Karnataka; resistant to 'tikka' leaf spots
8	'HG-10'	Karnataka	Semi-spreading	140	1,200 1,600	72.0	49.0	Grown in the southern districts of Karnataka
9	'HG-7'	Karnataka	Spreading	140	1,000 1,400	72.0	50.0	Grown in the southern districts of Karnataka
10	'Pondicherry-8'	Karnataka	Spreading	140	1,200 1,600	72.0	48.0	Grown in the northern districts of Karnataka
11	'Exotic-5' (strain 6608 of Argentina)	Madhya Pradesh	Bunch	105	1,120	75.0	47.0	Small seeded
12	'Chandori'	Madhya Pradesh	Bunch	110	1,600	79.0	53.0	High shelling out-turn
13	'Exotic-1-1'		Bunch	110	2,700	79.0	50.0	Small-seeded and high yield
14	'Gangapuri'	Madhya Pradesh	Bunch	105	2,000	74.0	50.0	Earliness; dark-green foliage; well-suited to light soils; preferred as table variety; 3-4-seeded pods
15	'Small Japan'	Madhya Pradesh	Bunch	110	1,500	77.0	49.0	Suitable for medium and light soils
16	'R-4'	Madhya Pradesh	Bunch	110	1,600	76.2	49.0	Well-suited for lighter and sandy soils
17	'Improved Spanish' (Groundnut)	Maharashtra	Bunch	105	1,020	75.0	50.0	Suitable for light soils, small-seeded

Table 10: Attributes of old groundnut varieties cultivated in different states of India from 1900-1940 (contd...)

S. No.	Variety	State for which recommended	Growth habit	Days to maturity	Pod yield (kg/ha)	Shelling outturn (%)	Oil (%)	Special features
18	'Improved Small Japan'	Maharashtra	Bunch	95	830	72.0	50.0	Early, easy to harvest
19	'AK-10'	Maharashtra	Semi-spreading	120	1,123	65.0	47.0	Bold pods
20	'AK-8-11'	Maharashtra	Semi-spreading	120	1,123	69.0	46.0	Bold pods
21	'Faizpur-1-5'	Maharashtra	Bunch	100-105	1,460	73.0	52.0	High yielding
22	'RS-1'	Rajasthan	Spreading	130-140	1,820	-	48.0	High yielding
23	'T-32'	Uttar Pradesh	Bunch	115	1,300	72.0	49.0	Early maturing, light-green large leaves
24	'T-64'	Uttar Pradesh	Semi-spreading	115	1,900	-	49.0	-
25	'T-25'	Uttar Pradesh	Spreading	135	1,600	72.0	48.0	Late, dark-green leaf, bold-seeded
26	'T-28'	Uttar Pradesh	Spreading	140	1,900	-	48.0	-
27	'T-99'	Uttar Pradesh	Spreading	140	1,900	70.0	47.0	Late, dark-green foliage, bold 2-3-seeded
28	'Ah-25 Madras'	West Bengal	Semi-spreading	150-160	1,900	67.0	48.0	Suitable for sandy-loams and gravel soils
29	'Spanish Peanut Nagpur'	West Bengal	Semi-spreading	150-160	1,000	68.0	48.0	Suitable for sandy soils
30	'B-30'	West Bengal	Semi-spreading	130-135	1,400	-	54.0	Suitable for sandy-loam soils
31	'B-31'	West Bengal	Semi-spreading	130-135	1,600	-	54.0	Suitable for sandy-loam soils

Note: Various descriptors of special features are the same as used in the source literature.

4. Pioneering States and Institutions Fostering Groundnut Varietal Development in India

In India, groundnut breeding began as early as in 1915 at the Hebbal Farm in Mysore. Subsequently in 1926, groundnut breeding was initiated by the erstwhile Madras State with the establishment of a Groundnut Research Station at Palakuppam (South Arcot District). Even prior to initiation of systematic breeding efforts, import and evaluation of many exotic varieties was going on at the College Farm at Saidapet and at the Agricultural Research Station, Palur, in Tamil Nadu wherefrom several varieties were supplied to Mysore (Seshadri, 1962). Later, groundnut improvement work was initiated in the Punjab, Bombay, Madhya Pradesh, and other states also. A short review of the work done in these states is given below.

Madras: The concerted efforts of crop improvement began with the establishment of a Research Station at Palakuppam, South Arcot district in 1926 exclusively for groundnut. Subsequently, in 1930, with the formation of a special 'Oilseeds Wing' in the State Agricultural Department, systematic breeding work on groundnut was taken up. To begin with, a comprehensive world collection of varieties and of forms was made and then systematic classification and detailed studies were conducted over a number of years.

By mass selection, two improved varieties 'TMV-1' (A.H. 25) and TMV-2 (A.H.-32) were released by the state in 1940s. The former is a spreading variety, isolated from an African variety, 'Saloum'. Similarly, 'TMV-2', a bunch variety, was evolved from the 'local' (North Arcot) bunch variety. These varieties have been very popular and were cultivated on a large-scale for several decades. 'TMV-2' is still popular among groundnut farmers in Andhra Pradesh, Karnataka and Tamil Nadu. A good number of high-yielding varieties were developed through pure line selection also. The varieties, 'TMV-3' (A.H. 698) and 'TMV-4' (A.H. 334) are the outstanding examples of success in this line. Hybridisation work was initiated during 1937 with the objective of developing bunch type varieties with dormant seeds.

Mysore: The Department of Agriculture in Mysore was the first in India to start intensive work on the groundnut crop. From 1913 onwards, the breeding work was undertaken at the Agricultural Farm, Hebbal (Bangalore). The initial experiments were limited to evaluation of exotic varieties. In 1918, an improved strain 'H.G. 1' was isolated from a natural cross of a spreading variety, 'Big Japan'. Subsequently, another strain 'H.G. 3', with small-size pods was also released. Through hybridisation between promising parents and on the subsequent selection, the Department accumulated a wealth of material which required intensive study and critical investigation. Therefore, an intensive breeding scheme for groundnut was taken up in this state from 1944 to 1952 with the object of replacing the commercial varieties then in cultivation with the improved varieties.

From the progenies of crosses between 'Valencia' and 'Tennessee White', three hybrid strains 'G-0342', 'G-0341', and 'G-0268' with bolder kernels than those of 'Local Spanish' were evolved. These varieties were good for direct consumption. By selection in short-duration bunch varieties and progenies, two selections from 'Small Japan' and 'G-0416', and a hybrid between 'Spanish' and 'Small Japan' were developed. Among the late maturing bunch types, two hybrids from 'Tennessee White' and 'Valencia' and 'Tennessee White' and 'G-0620' were developed. Through hybridisation, two other genotypes 'H.G. 5' (Mysore local × Spanish) and H.G. 6 (Virginia × Small Japan) were also developed. Both these genotypes possessed a good canopy growth and hence were also found suitable for forage purpose (Seshadri, 1962).

Punjab: The improvement of groundnut crop in this state was taken up initially at Ludhiana and a few improved varieties were developed for irrigated conditions. Since the crop in east Punjab was grown mostly under rain-fed conditions, in 1945, the research activities were shifted to Samrala, considered to be the heart of the groundnut cultivation in the state. The work comprised acclimatisation of exotic varieties and selection of varieties suitable for cultivation. For this, a large number of genotypes were collected from different locations and their suitability was evaluated for east Punjab conditions. As a result, from

'Samrala Local', a spreading variety 'Punjab Groundnut No. 1' was developed, which is still popular in the traditional rain-fed areas of Punjab and Rajasthan.

Madhya Pradesh: Research work on groundnut was initiated at the Government Experimental Farm, Akola (now in Maharashtra state). In the beginning, the work was confined to varietal trials and selections for developing improved varieties. The varieties like 'A.K. 12-24', 'Improved Spanish', and 'Improved Small Japan' developed by selection, were recommended for general cultivation and the large-seeded varieties, 'A.K. 10' and 'A.K. 8-11', were recommended for table purpose.

Uttar Pradesh: The work on groundnut improvement began in 1932 at the Government Research Farm, Kanpur. Initially pure line selections were made from a large collection comprising genotypes gathered from different parts of Uttar Pradesh, Baroda in Gujarat, Assam, Poona (in Maharashtra), Madras, Hyderabad, Bengal and Nagpur. As a result, some high yielding varieties, viz., Types 18, 23, 24 and 25 were released for different regions of the state. As none of the cultures possessed all the desirable attributes, hybridisation between the selected types were attempted in 1950 to develop superior genotypes.

Bombay: The work began at the Cotton Breeding Section at the Government Farm, Dharwad (now in Karnataka) and three improved strains, viz., 'Pondicherry No. 1', 'Spanish Peanut No. 5' and 'Spanish Improved' were developed by selection. The work on the spreading types was initiated at the Government Farm, Kopergaon and two varieties, 'Kopergaon No. 1' and 'Kopergaon No. 3' were developed.

Subsequently, the work on the crop was conducted on a small scale at the Government Farm, Jalgaon (in black cotton soils). At this centre, selection was attempted from the local bunch varieties. A similar work was pursued at the Agricultural Research Station, Karad (north Satara), and three promising selections (Dombri No. 1, Karad 4-11 and Karad 5-8) in the spreading group and three (G-791, ECR-583 and Padegaon No. 2) in the erect group were developed.

ICRISAT, Patancheru: Until 1976, the Indian researchers had access to only about 6,000 germplasm accessions, predominantly indigenous with a narrow range of genetic variability. With the establishment of ICRISAT in 1976 at Patancheru in Andhra Pradesh, the groundnut improvement programme received a fresh impetus for groundnut research in India.

Global collection of about 15,000 germplasm and its systematic evaluation at ICRISAT, led to identification of several sources of resistance to both biotic and abiotic stresses. During 1980's, ICRISAT allowed access to Indian groundnut researchers to even exotic germplasm collected from different centres of diversity, particularly from South America, the primary centre of diversity. This led to a significant improvement in development of high-yielding stress-tolerant varieties. The supply of various sources of resistance, segregating and advanced breeding material helped greatly in reorienting the breeding programmes of the National Agricultural Research Systems (NARS) in the desired direction.

During 1980 to 1995, the Indian programme spearheaded by AICRP-Groundnut and its network of centres situated at strategic locations, received more than 38,362 genotypes comprising germplasm accessions and breeding material (Singh and Nigam, 1996). This led to enhanced use of exotic germplasm in the national programme resulting in development of a number of varieties, such as JL-24, GG-2, Kadiri-3, M-13 and J-11 with tolerance to various stresses.

This collaboration for genetic enhancement led to further release of 20 improved varieties either directly by ICRISAT (ICGSs' 1, 5, 11, 37, 44, 76, ICGVs' 86325, 86590, ICGV-91114) or through SAU's (BSR 1, ALR 1, ALR 2, VRI 1, RG 141, SG 88, SG 99, Pratap Munghali-1, Pratap Munghali-2, Avtar, ICGV-00348, ICGV-00350, R-2001-2, R-2001-3, Mallika and VL Munghali-1). Several other promising genotypes selected from the basic material supplied by ICRISAT, are in the pipeline in various states and AICRP-Groundnut varietal evaluation programmes.

Bhaba Atomic Research Centre , Trombay: Bhaba Atomic Research Centre (BARC), Trombay, initiated a mutation-breeding project as early as in 1957 and became the pioneering institution in mutation-breeding research on groundnut in the country. The BARC has the credit of developing a number of promising semi-dwarf mutants with compact branching and large seeds. As many as 14 groundnut varieties popularly referred to as 'Trombay Groundnuts (TG)' have been developed either through mutation and selection or use of mutants in hybridisation followed by selection. Two varieties, 'TG-1' and 'TG-3' were developed by BARC by irradiating the kernels of 'Spanish Improved' with X-rays (75 Kr). The seeds of variety 'TG-1' were large (85 g/100 seed) while those of 'TG-3' were medium bold (50 g/100 seed). In addition, two early-maturing mutant genotypes (TGE-1 and TGE-2), and one water use and partitioning efficient variety, TAG- 24, have also been developed. Subsequently, the BARC also evolved a novel breeding technique of using irradiation followed by recombination and thus developed about 10 more varieties.

All India Coordinated Research Project on Groundnut (AICRP-G): With the establishment of the All India Coordinated Research Project on Oilseeds (AICORPO) by the ICAR in 1967, the systematic work on groundnut breeding was given yet another impetus. Subsequently, in 1992, the groundnut component was delineated from AICORPO and given an independent status by formation of 'All India Coordinated Research Project on Groundnut' (AICRP-G). Since then many niche-specific, stress-tolerant and high-yielding varieties developed by various SAUs' and other ICAR institutions have been released (Table 11). By 2012, 194 varieties (108 Spanish bunch; 5 Valencia; 50 Virginia bunch and 31 Virginia runner) have been released.

A comprehensive list of varieties released by various institutions is provided in Table 11.

Table 11. An institution-wise account of release of varieties

S. No.	Institution	Number of varieties released				Total
		Spanish bunch	Valencia	Virginia runner	Virginia bunch	
1	Acharya N.G. Ranga Agricultural University, Hyderabad	K-134, Kadiri-4, Kadiri-5, Kadiri-6, Kadiri Harithandra, Kadiri-9, Tirupati-2, Tirupati-3, Tirupati-4, JCG-88, Prasana, Abhaya, Kalahasti, Narayani, Greeshma,	-	Kadiri-71-1	Kadiri-2, Kadiri-3, Kadiri-7, Kadiri-8	23
2	Bhabha Atomic Research Centre, Mumbai	TG-3, TG-17, TG-22, TAG-24, TG-26, TG-37A, TG-38B, TG-51, TPG-41	-	Somnath	TG-1	11
3	Birsa Agricultural University, Kanke	-	-	-	BAU-13, BG-1, BG-2, BG-3	4
4	Chaudhary Charan Singh Haryana Agricultural University, Hissar	MH-1	MH-2, MH-4	-	-	3
5	Azad University of Agriculture & Technology, Kanpur	-	-	CSMG-84-1, CSMG-9510, Chandra, Chitra, T-28, Faizpur-1-5, Divya (CSMG-2003-19)	CSMG-884, T-64, Kaushal MA-16	11
6	Directorate of Oilseeds Research, Hyderabad	Mankya (DRG-12)	-	-	DRG-17	2
7	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli	TKG-19A (TG-19A)	-	-	Konkan Gaurav	2
8	Junagadh Agricultural University, Junagadh	J-11, GAUG-1, GG-2, GG-3, GG-5, GG-6, GG-7, GG-8, GJG-31 (J-71), GJG-9 (J-69)	-	GAUG-10, GG-11, GG-12, GG-14, GG-16, GJG-HPS-1 (JSP-HPS-44), GJG-17 (JSP-48)	GG-20, GG-21, GJG-22 (JSSP 36)	20
9	Indian Agricultural Research Institute Regional Station, Hyderabad	RSHY-1	-	-	-	1
10	International Research Institute for Semi-Arid Tropics, Patancheru	ICGS-1, ICGS-11, ICGS-37, ICGS-44, ICGV-86590, ICG (FDRS)-10, ICGV-91114	-	-	ICGS-5, ICGS-76, ICGS-86325	10
11	Jawaharlal Nehru Krishi Viswavidyalaya, Jabalpur	Jyoti, JGN-2, JGN-3, JGN-23	Ganga puri	-	-	5
12	Kerala Agricultural University, Thrissur	-	-	-	Sneha, Snigdha	2

Table 11. An institution-wise account of release of varieties (contd.)

S. No.	Institution	Varieties released				Total
		Spanish bunch	Valencia	Virginia runner	Virginia bunch	
13	Marathwada Agricultural University, Parbhani	LGN-1, TLG-45	-	-	LGN-2	3
14	Maharana Pratap University of Agriculture & Technology, Udaipur	Pratap Mungphalli-1, Pratap Mungphalli-2, Pratap Raj Mungphali	-	-	-	3
15	Mahatma Phule Krishi Vidyapeeth, Rahuri	SB XI, JL-24, JL-220, JL-286, JL-501	Kopergaon-3	Karad-4-1	Kopergaon-1, B-95	9
16	Directorate of Groundnut Research, Junagadh (formerly known as National Research Centre for Groundnut)	Girnar-1, Girnar-3	-	-	Girnar-2	3
17	Odisha University of Agriculture & Technology, Bhubaneswar	Kisan, Jawan, Smruti (OG-52-1)	-	-	-	3
18	Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola	AK-12-24, AK-159	-	UF-70-103	AK-265, AK-303	5
19	Punjab Agricultural University, Ludhiana	SG-84, SG-99	-	Punjab-1, M-13, M-37, M-335, M-548	c-501, M-145, M-522, M-197	11
20	Rajasthan Agricultural University, Bikaner	RG-141	-	RS-1, RG-382, Raj Mungfali-1 (RG-510)	RSB-87, RSB-138, HNG-10, TG-39, HNG-69, HNG-123, ICHG-00440, Raj Durga (RG-425)	12
21	Tamil Nadu Agricultural University, Coimbatore	Pollachi-1, Pollachi-2, ALR-2, CO-1, CO-2, CO-3, Co (Gn)-4, TMV-2, TMV-5, TMV-7, TMV-9, TMV-12, TMV (Gn)-13, VRI-1, VRI-2, VRI-3, VRI-4, ALR-3, VRI (Gn)-5, VRI (Gn)-6, BSR-1	TMV-11	TMV-1, TMV-3, TMV-4	TMV-6, TMV-8, TMV-10, ALR-1, ICGV-00348, VRI (Gn)-7, Co (Gn)-5, Co-6	33
22	University of Agricultural Sciences, Dharwad	Spanish Improved, Dh-3-30, Dh-8, Dh-86, GPBD-4, Dh-101, Mutant-III, KRG-1, S-206, GPBD-5, R-9251, R-8808, R-2001-3, R-2001-2	-	DSG-1, S-230	TGLPS-3	16
23	Vivekananda Parvatiya Krishi Anusandhan Shala, Almora	VL-Moongphali-1	-	-	-	1
	Total	107	5	31	50	193

Note: For the variety, 'Kuber' (Notification number, S.O. 13 dated 19-12-78) the details of sponsoring agency and state for which recommended is not known. Including Kuber the total number of varieties released in India is 194

5. Notification and National Identity Numbers

The Central Sub-committee on Crop Standards, Notification and Release of Varieties in Agricultural Crops (CSCCSN&RVAC) constituted under the Seeds Act, 1966, has played a crucial role in regulating the release of varieties of various crops developed in public domain and thereby affording a recognition to the role of quality in seed production to increase crop productivity.

The purpose of release of varieties is to introduce the newly evolved varieties to the public for general cultivation in the region for which it is suitable. It enables the farmers to choose the cultivars that are suitable for cultivation in their region. In other words, the release of cultivars is also a sort of recommendation to the farmers for adoption of the released varieties.

The actual practice of official release of cultivars started in October 1964 with the formation of the Central Variety Release Committee (CVRC) at the central level and State Variety Release Committee (SVRC) at the State level. The Central Variety Release Committee functioned only up to 1969 when its functions were taken over by the Central Seeds Committee (CSC) established under the Seeds Act, 1966. The Central Seeds Committee constituted a Central Sub-Committee on Crop Standards, Variety Release and Notification on Agricultural Crops (CSCCSN&RVAC) to discharge the functions of release and notification, provisional notification and de-notification of varieties at central level, while State Seed Sub-Committee (SSSC) were assigned with similar functions for release at the state level. Hence, the varieties released before 1964 by different states could not be assigned notification numbers unless the proposals were submitted for notification to CSCCSN&RVAC. This is why for all the varieties released prior to 1964, the year of release by the state government and the year of notification by CSCCSN&RVAC, are different.

So far, 194 groundnut varieties 108 Spanish bunch, 5 Valencia, 50 Virginia bunch and 31 Virginia runner have been released by different institutions (SAUs, BARC, ICAR institutes and ICRISAT). The habit group-wise details of the varieties released along with the notification number are provided in Table 12. Of these, varieties released centrally and notified by the Central Sub-Committee on Crop Standards, Variety Release and Notification on Agricultural Crops were 53 while those of the state releases were 141. However, varieties which were already released by the states but yet not been notified due to non-submission of notification proposal or due to other deficiencies are 21 in number (Table 12).

For a centrally released variety, the year of release and notification would remain the same as the proposals of the varieties identified in the respective workshops, is submitted to the Central Sub-Committee for notification through the Crop Coordinator who ensures timely submission of the proposals. Conversely, for a state released variety, the year of release and notification would differ as it depends on the time of submission of the notification proposal by the respective State Departments of Agriculture.

Some of the old state and obsolete varieties having certain deficiencies have already been proposed by the authorities concerned for denotification (Table 12). Thus, four varieties, Punjab No.-1, Kopergaon-1, Co-1, and Pollachi-2 have been denotified.

Looking to the importance of conserving the national wealth of released varieties, NBPGR has played a key role and collected the seed pods of all the released varieties from the respective breeders/institutes and assigning them “National Identity Numbers (ICs)” and then conserve these under long term cold storage facility available at the National Gene Bank, NBPGR, New Delhi for use in future. The IC numbers as assigned by NBPGR are provided in Table 12.

Table 12. List of groundnut varieties released in India and their national identity and notification number

a. Habit group: Spanish bunch

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
1	Spanish Improved	IC-305006	UAS, Dharwad	1905	State	371(E)/29.5.82
2	AK-12-24	IC-304923	PKV, Akola	1940	State	361(E)/30.6.73 and 786/2.2.76
3	TMV-2	IC-305018	TNAU, Tindivanam	1940	State	786/2.2.76
4	TMV-5	IC-305021	TNAU, Tindivanam	1950	State	-
5	J-11	IC-304966	GAU, Junagadh	1964	State	-
6	SB XI	IC-113088	MPKV, Jalgaon	1965	State	4045/24.9.69
7	TMV-7	IC-305023	TNAU, Tindivanam	1967	State	440(E)/21.8.75 and 540(E)/24.7.85
8	Pollachi-1	IC-297079	TNAU, Aliyarnagar	1968	State	440/21.8.75 and 786/2.2.76
9	S-206	IC-305001	UAS, Raichur	1969	State	19(E)/14.1.82
10	TMV-9	IC-305025	TNAU, Tindivanam	1970	State	-
11	Jyoti (KG-61-240)	IC-304970	JNKVV, Khargone	1971	State	786/2.2.76
12	Kuber	-	-	1972	State	13/19.12.78
13	GAUG-1 (J-113)	IC-541722	JAU, Junagadh	1973	State	499(E)/8.7.83
14	Pollachi-2*	IC-113084	TNAU, Aliyarnagar	1973	State	13/19.12.78; denotified 424/8.6.99
15	Dh-3-30	IC-113078	UAS, Dharwad	1975	State	19(E)/14.1.82
16	MH-1	IC-304988	CCSHAU, Hissar	1975	State	-
17	Phule Pragati (JL-24)	IC-304969	MPKV, Jalgaon	1978	State	596(E)/13.8.84
18	TMV-12	IC-305028	TNAU, Tindivanam	1978	State	19(E)/14.1.82
19	Co-1*	IC-304936	TNAU, Coimbatore	1979	State	19(E)/14.1.82; denotified/424/8.6.99
20	Kisan	IC-113090	OUA&T, Chiplima	1980	State	832(E)/18.11.85
21	KRG-1	IC-296351	UAS, Raichur	1981	State	499(E)/8.7.83
22	TG-17	IC-78646	BARC, Mumbai	1982	State	832(E)/18.11.85
23	GG-2 (Gujarat Groundnut-2)	IC-304947	JAU, Junagadh	1983	State	295 (E)/9.4.85
24	Jawan (OG-71-3)	IC-113085	OUA&T, Chiplima	1983	State	867(E)/26.11.86
25	Co-2	IC-305097	TNAU, Coimbatore	1983	State	258(E)/14.5.86
26	JGN-2 (Jawahar Moongphali-2)	-	JNKVV, Khargone	1983	State	499(E)/8.7.83
27	Dh-8	IC-308029	UAS, Dharwad	1984	State	-
28	TG-3	IC-78643	BARC, Mumbai	1985	State	165(E)/ 6.3.87
29	ICGS-11 (ICGV-87122)	IC-118837	ICRISAT, Hyderabad	1986	Central	1867(E)/ 26.11.86
30	Spring Groundnut-84 (SG-84)	IC-305004	PAU, Ludhiana	1986	State	165(E)/6.3.87
31	VRI-1	IC-305030	TNAU, Vriddhachalam	1986	State	10(E)/1.1.88
32	Girnar-1 (CGC-4018)	IC-304954	NRC, Junagadh	1988	Central	471(E)/5.5.88
33	ICGS-44 (ICGV-87128)	IC-118839	ICRISAT, Hyderabad	1988	Central	471(E)/5.5.88

Table 12. List of groundnut varieties released in India and their national identity and notification number (contd.)

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
34	VRI-2	IC-305031	TNAU, Vriddhachalam	1989	State	915(E)/6.11.89
35	RG-141	IC-113098	RAU, Durgapura	1989	State	527(E)/16.8.91
36	ICGS-1 (ICGV-87119)	IC-118835	ICRISAT, Hyderabad	1990	Central	386(E)/15.5.90
37	ICG (FDRS)-10 (ICGV-87160)	IC-118842	ICRISAT, Hyderabad	1990	Central	386(E)/15.5.90
38	VRI-3 (VG-55)	IC-113089	TNAU, Vriddhachalam	1990	State	793(E)/22.11.91
39	ICGS-37 (ICGV-87187)	IC-118838	ICRISAT, Hyderabad	1990	Central	639(E)/ 17.8.90
40	Pragathi (RSHY-1)	IC-305000	IARI, Hyderabad	1991	Central	793(E)/22.11.91
41	TAG-24	IC-305009	BARC, Mumbai	1991	State	814(E)/4.11.92
42	Tirupati-2	IC-305015	ANGRAU, Tirupati	1991	State	527(E)/16.8.91
43	ICGV-86590 (ICGS-86)	IC-118841	ICRISAT, Hyderabad	1991	Central	793(E)/22.11.91
44	TG-22	-	BARC, Mumbai	1992	State	636(E)/02.9.94
45	Tirupati-3 (TCG-1518)	IC-296350	ANGRAU, Tirupati	1993	State	615(E)/17.8.93
46	JCG-88 (Jagtial-88)	-	ANGRAU, Jagtial	1993	State	401(E)/15.5.98
47	GG-3 (Gujarat Groundnut-3)	IC-304948	JAU, Junagadh	1994	Central	408(E)/4.5.95
48	Mankya (DRG-12)	IC-304941	DOR, Hyderabad	1994	Central	408(E)/4.5.95
49	ALR-2 (ALG-56)	IC-304925	TNAU, Aliyarnagar	1994	State	360(E)/1.5.97
50	BSR-1 (ICGV-86143)	IC-304932	TNAU, Bhavanisagar	1994	State	360(E)/1.5.97
51	TKG-19A	IC-305016	Dr.B.S.K.K.V, Dapoli	1995	State	1(E)/1.1.96
52	Vemana (K-134)	IC-304971	ANGRAU, Kadiri	1995	Central	1(E)/1.1.96
53	Kadiri-4 (K-150)	IC-304974	ANGRAU, Kadiri	1995	State	662(E)/17.9.97
54	Smruti (OG-52-1)	IC-304991	OUA&T, Chiplima	1995	State	1(E)/1.1.96
55	TG-26	IC-305013	BARC, Mumbai	1995	Central	1(E)/1.1.96
56	Tirupati 4(TCGS-30)	IC-305105	ANGRAU, Tirupati	1995	State	92(E)/2.2.01
57	VRI-4	IC-305033	TNAU, Vriddhachalam	1996	State	662(E)/17.9.97
58	GG-5	IC-305102	JAU, Junagadh	1997	State	425(E)/8.6.99
59	Jawahar Groundnut-3 (JGN-3)	IC-295966	JNKVV, Khargone	1997	State	425(E)/8.6.99
60	R-9251	IC-296348	UAS, Raichur	1997	State	401(E)/15.5.98
61	Apoorva (R-8808)	IC-304995	UAS, Raichur	1997	Central	662(E)/17.9.97
62	Phule Vyas (JL-220)	IC-305104	MPKV, Jalgaon	1998	State	821(E)/13.9.2000
63	ALR-3 (ALG-63)	IC-304926	TNAU, Aliyarnagar	1999	State	821(E)/13.9.2000
64	Co-3(TNAU-256)	IC-305098	TNAU, Coimbatore	1999	State	821(E)/13.9.2000
65	VRI (Gn)-5	IC-305110	TNAU, Vriddhachalam	2001	State	1134(E)/15.11.01
66	Co (Gn)-4 (TNAU-269)	IC-305100	TNAU, Coimbatore	2001	State	1134(E)/15.11.01
67	GG-7(J-38)	IC-305103	JAU, Junagadh	2001	State	1134(E)/15.11.01

Table 12. List of groundnut varieties released in India and their national identity and notification number (contd.)

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
68	AK-159	IC-305096	PKV, Akola	2002	Central	937(E)/4.9.02
69	GG-6	IC-305107	JAU, Junagadh	2003	State	283(E)/12.3.03
70	TPG-41	IC-296547	BARC, Mumbai	2004	Central	161(E) 4.2.04
71	TG-37A	IC-398406	BARC, Mumbai	2004	Central	161(E)/4.2.04
72	Vikas (GPBD-4)	IC-308546	UAS, Dharwad	2004	Central	642(E)/31.5.04
73	Prutha (Dh-86)	IC-420761	UAS, Dharwad	2005	Central	122(E)/2.2.05
74	Kadiri-5	IC-412897	ANGRAU, Kadiri	2005	State	122(E)/2.2.05
75	Kadiri-6 (K-1240)	IC-412898	ANGRAU, Kadiri	2005	State	122(E)/2.2.05
76	Pratap Mungphali-2 (ICUG-92195)	IC-427878	MPAU&T, Udaipur	2005	State	1566(E)/5.11.05
77	Pratap Mungphali-1 (ICUG-92035)	IC-427778	MPAU&T, Udaipur	2005	State	1566(E)/5.11.05
78	GG-8 (J-53)	IC-538571	JAU, Junagadh	2006	Central	1572(E)/20.9.06
79	TG-38B (TG-38)	IC-323364	BARC, Mumbai	2006	Central	1572(E)/ 20.9.06
80	Vasundhara (Dh-101)	IC-556928	UAS, Dharwad	2007	Central	122(E)/6.2.07
81	Ratneshwar (LGN-1)	IC-547028	MAU, Latur	2007	State	122(E)/6.2.07
82	TLG-45	IC-323366	MAU, Latur	2007	State	122(E)/6.2.07
83	SG-99	IC-412896	PAU, Ludhiana	2007	Central	1178(E)/20.7.07
84	Prasuna (TCGS-341)	IC-546629	ANGRAU, Tirupati	2007	State	1178(E)/20.7.07
85	ICGV-91114	-	ICRISAT, Hyderabad	2007	State	1178(E)/20.7.07
86	Phule Unap (JL-286)	IC-308555	MPKV, Jalgaon	2007	State	1178(E)/20.7.07
87	Abhaya (TPT-25)	IC-546628	ANGRAU, Tirupati	2007	State	1178(E)/20.7.07
88	TMV (Gn)-13 (TNAU-325)	-	TNAU, Coimbatore	2007	State	1178(E)/20.7.07
89	Kalahasti (TCGS-320)	IC-296315	ANGRAU, Tirupati	2007	State	1703(E)/5.10.07
90	Narayani (TCGS-29)	IC-296314	ANGRAU, Tirupati	2007	State	1703(E)/5.10.07
91	VL-Moongphali-1	IC-563978	VPKAS, Almora	2008	State	211(E)/ 29.1.2010
92	TG-51	IC-555946	BARC, Mumbai	2008	Central	12458(E)/16.10.08
93	Ajeya (R-2001-3)	IC 557647	UAS, Raichur	2008	Central	2458(E)/16.10.08
94	VRI (Gn)-6 (VG-9816)	IC-553320	TNAU, Vriddhachalam	2009	Central	449(E)/11.2.09
95	JGN-23(Jawahar Groundnut-23)	IC-560683	JNKVV, Khargone	2009	State	449 (E)/11.2.09
96	Kadiri-9	IC-570604	ANGRAU, Kadiri	2009	State	2187 (E)/27.8.09
97	Greeshma	IC-510879	ANGRAU, Tirupati	2009	State	2187 (E)/27.8.09
98	Vijetha (R-2001-2)	IC-565710	UAS, Raichur	2010	Central	211(E)/29.1.10
99	Gimar-3 (PBS-12160)	IC-571728	DGR, Junagadh	2010	Central	733(E)/1.4.10
100	Kadiri Haritandhra (K-1319)	IC-570601	ANGRAU, Kadiri	2010	Central	733(E)/1.4.10
101	GPBD-5	IC-572918	UAS, Dharwad	2010	Central	2137(E)/31.8.10

Table 12. List of groundnut varieties released in India and their national identity and notification number (contd.)

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
102	JL-501	IC-551599	MPKV, Jalgaon	2010	Central	211(E)/29.1.10
103	RARS-T-1	-	ANGRAU, Tirupati	2011	State	283(E)/7.2.11
104	RARS-T-2	-	ANGRAU, Tirupati	2011	State	283(E)/7.2.11
105	Pratap Raj Mungphali	IC-569093	MPAU&T, Udaipur	2011	State	283(E)/7.2.11
106	ICGV-00350	IC-587789	ANGRAU, Tirupati	2012	Central	456(E)/16.3.12
107	GJG-31 (J-71)	IC-583377	JAU, Junagadh	2012	State	1708(E)/26.7.12
108	GJG-9 (J-69)	IC-583379	JAU, Junagadh	2012	State	1708(E)/26.7.12

b. Habit group: Valencia

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
1	Kopergaon-3	IC-304979	MPKV, Kopergaon	1933	State	-
2	Gangapuri	IC-304944	JNKVV, Khargone	1971	State	-
3	TMV-11	-	TNAU, Tindivanam	1977	State	-
4	MH-2	IC-113042	CSSHAU, Hissar	1978	State	13/19.12.78
5	MH-4	IC-113043	CSSHAU, Hissar	1989	State	386(E)/15.5.90

c. Habit group: Virginia bunch

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
1	Kopergaon-1*	IC-444790	MPKV, Kopergaon	1933	State	19(E)/14.1.82; denotified 429 (E)/3.6.94
2	RSB-87	IC-304999	RAU, Durgapura	1961	State	19(E)/14.1.82
3	TMV-6	IC-308145	TNAU, Tindivanam	1961	State	-
4	c-501	IC-306794	PAU, Ludhiana	1961	State	-
5	T-64 (Type-64)	IC-305008	CSAUA&T, Mainpuri	1966	State	13/19.12.78
6	TMV-8	IC-437415	TNAU, Tindivanam	1968	State	-
7	M-145	IC-304983	PAU, Ludhiana	1968	State	361(E)/30.6.73
8	TMV-10	IC-305026	TNAU, Tindivanam	1970	State	786/2.2.76
9	Vikram (TG-1)	IC-78642	BARC Mumbai	1973	State	-
10	Kadiri-2 (MK-374)	IC-113087	ANGRAU, Kadiri	1978	State	470(E)/19.2.80
11	Kadiri-3	IC-304973	ANGRAU Kadiri	1978	State	470(E)/19.2.80
12	BG-1 (Birsa Groundnut-1)	IC-304929	BAU, Kanke	1979	State	499(E)/8.7.83
13	Birsa Groundnut-2 (BG-2)	IC-304930	BAU, Kanke	1979	State	2(E)/3.1.83
14	M-197	IC-304984	PAU, Ludhiana	1982	State	832(E)/18.11.85

Table 12. List of groundnut varieties released in India and their national identity and notification number (contd.)

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
15	Kaushal (G-201)	IC-304976	CSAUA&T, Mainpuri	1984	Central	295(E)/9.4.85
16	BG-3 (Birsa Groundnut-3)	IC-304931	BAU, Kanke	1986	State	386(E)/15.5.90
17	MA-16	IC-304987	CSAUA&T, Mainpuri	1986	State	-
18	ALR-1	IC-304924	TNAU, Aliyarnagar	1987	State	915(E)/6.11.89
19	ICGS-76 (ICGV-87141)	IC-118840	ICRISAT, Patancheru	1989	Central	915(E)/ 6.11.89
20	RS-138	IC-113097	RAU, Durgapura	1989	State	-
21	Konkan Gaurav	-	Dr.B.S.K.K.V, Dapoli	1990	State	615(E)/17.8.93
22	GG-20 (Gujarat Groundnut-20)	IC-304953	GAU, Junagadh	1992	State	814 (E)/4.11.92
23	ICGS-5 (ICGV-87121)	IC-118836	ICRISAT, Hyderabad	1992	Central	615(E)/17.8.93
24	BAU-13 (Birsa bold-1)	IC-304928	BAU, Kanke	1993	State	636(E)/2.9.94
25	B-95	IC-304927	MPKV, Rahuri	1993	State	-
26	ICGV-86325	IC-304964	ICRISAT, Hyderabad	1994	Central	408(E)/4.5.95
27	Mukta (DRG-17)	IC-304942	DOR, Hyderabad	1994	Central	408(E)/4.5.95
28	M-522	IC-304986	PAU, Ludhiana	1995	State	1(E)/1.1.96
29	HNG-10	IC-304955	RAU, Hanumangarh	1998	Central	425(E)/8.6.99
30	Sneha	-	KAU, Vellayani	1998	State	937(E)/4.9.02
31	Snigdha	-	KAU, Vellayani	1998	State	937(E)/4.9.02
32	Prakash (CSMG-884)	IC-304938	CSAUA&T, Mainpuri	1999	Central	425(E)/8.6.99
33	Manjra (LGN-2)	IC-304980	MAU, Latur	2000	Central	92(E)/2.2.01
34	GG-21(JSSP-15)	IC-445051	JAU, Junagadh	2005	Central	449(E)/11.2.09
35	Co (Gn)-5	IC-295971	TNAU, Coimbatore	2005	State	1177(E)/25.8.05
36	AK-265	IC-544850	PDKV, Akola	2007	Central	1703(E)/5.10.07
37	AK-303	IC-544849	PDKV, Akola	2007	State	449(E)/11.2.09
38	TBG-39 (TG-39)	IC-323365	RAU, Bikaner	2007	State	2458(E)/16.10.08
39	Girnar-2 (PBS-24030)	IC-552493	NRCG, Junagadh	2008	Central	72(E)/10.1.08
40	ICGV-00348	IC-556930	TNAU, Vriddhachalam	2008	Central	2458(E)/16.10.08
41	VRI (Gn)-7	IC-565195	TNAU, Vriddhachalam	2008	State	2187(E)/27.8.09
42	Kadiri-7	IC-570602	ANGRAU, Kadiri	2009	State	2187(E)/ 27.8.09
43	Kadiri-8	IC-570603	ANGRAU, Kadiri	2009	State	2187 (E)/ 27.8.09
44	Mallika (ICHG-00440)	IC-561239	RAU, Hanumangarh	2009	Central	2187(E)/ 27.8.09
45	TGLPS-3 (TDG-39)	IC-556927	UAS, Dharwad	2009	State	449 (E)/11.2.09
46	HNG-69	IC-571741	RAU, Hanumangarh	2010	Central	211(E)/ 29.1.10
47	Raj Durga (RG-425)	-	RAU, Dugrapura	2011	State	283(E)/7.2.11
48	HNG-123	IC-587435	RAU, Hanumangarh	2012	Central	456(E)/16.3.12
49	TNAU Groundnut CO-6 (ICGV-87846)	IC-585621	TNAU, Coimbatore	2012	State	1708(E)/26.7.12
50	GJG-22 (JSSP-36)	-	JAU, Junagadh	2013	State	312(E)/01.02.13

Table 12. List of groundnut varieties released in India and their national identity and notification number (contd.)

d. Habit group: Virginia runner

S. No.	Variety	National identity no.	Originating Centre	Year and status of release		Notification number
				Year	State or Central	
1	TMV-1	IC-437544	TNAU, Tindivanam	1940	State	-
2	TMV-3	IC-305019	TNAU, Tindivanam	1943	State	-
3	TMV-4	IC-437675	TNAU, Tindivanam	1947	State	-
4	Punjab-1*	IC-304994	PAU, Ludhiana	1953	State	361(E)/30.6.73; 786/2.2.76; denotified/14/19.12.78
5	RS-1	IC-113079	RAU, Dugrapura	1953	State	-
6	Karad-4-11	IC-304975	MPKV, Rahuri	1957	State	19(E)/14.1.82
7	T-28 (Type-28)	IC-305007	CSAUA&T, Mainpuri	1960	State	13/19.12.78
8	S-230	IC-305032	UAS, Raichur	1969	State	-
9	Kadiri-71-1	IC-296349	ANGRAU, Kadiri	1971	State	-
10	M-13	IC-304981	PAU, Ludhiana	1972	State	361(E)/ 30.6.73; 1004/23.3.78
11	GAUG-10	IC-304946	JAU, Junagadh	1973	State	499(E)/8.7.83
12	Faizpur-1-5	IC-10981/ Ec490438	CSAUA&T, Mainpuri	1976	State	786/2.2.76
13	Chandra (Ah-114)	IC-304934	CSAUA&T, Mainpuri	1977	State	13/19.12.78
14	M-37	IC-113083	PAU, Ludhiana	1980	State	19(E)/14.1.82
15	Chitra (MA-10)	IC-304935	CSAUA&T, Mainpuri	1984	State	540(E)/24.7.85
16	UF-70-103	IC-113091	PKV, Akola	1984	State	540(E)/24.7.85
17	GG-11 (Gujarat Groundnut-11)	IC-304950	JAU, Junagadh	1984	State	10(E)/1.1.88
18	M-335	IC-304985	PAU, Ludhiana	1986	State	10(E)/1.1.88
19	Somnath (TGS-1)	IC-113086	BARC, Mumbai	1990	Central	793(E)/22.11.91
20	GG-12 (Gujarat Groundnut-12)	IC-304951	GAU, Junagadh	1992	State	814(E)/4.11.92
21	Ambar (CSMG-84-1)	IC-304937	CSAU A&T Mainpuri	1992	Central	615(E)/17.8.93
22	DSG-1	IC-304943	UAS, Dharwad	1997	State	647(E)/9.9.97
23	GG-14 (JSP-28)	IC-296317	JAU, Junagadh	2003	Central	283(E)/12.3.03
24	Utkarsh (CSMG-9510)	IC-449057	CSAU&T, Mainpuri	2005	Central	449(E)/11.2.09
25	Durga (RG-382)	IC-430410	RAU, Durgapura	2005	State	122(E)/2.2.05
26	GG-16 (JSP-39)	IC-538572	JAU, Junagadh	2006	Central	1572(E)/ 20.9.06
27	M-548	IC-512312	PAU, Ludhiana	2007	State	1178(E)/20.7.07
28	GJG-HPS-1 (JSP-HPS-44)	IC-573466	JAU, Junagadh	2010	State	2137(E)/31.8.10
29	Divya (CSMG 2003-19)	IC 573901	CSAUA&T, Mainpuri	2011	Central	2326(E)/10.10.11
30	Raj Mungfali-1 (RG-510)	-	RAU, Dugrapura	2012	Central	456(E)/16.3.12
31	GJG-17 (JSP-48)	-	JAU, Junagadh	2013	State	312(E)/01.02.13

* Varieties denotified

6. Groundnut Breeding and Varietal Development in India

The area under groundnut in India was only 0.23 million ha during the period 1900-01 to 1909-10, which expanded to 7.5 million ha by the turn of century. The decennial annual compound growth rate during different periods depicts that the growth in area (17.2%) was the major factor for increase in groundnut production during 1951-1960. After 1970's, the growth in productivity (2.5% during 1971-80; 8.2% during 1981-90; 6.64% during 1991-2000 and 2.80% during 2001-10) contributed more to increase of groundnut production than the increase in area.

The increase in production and productivity even under the rain-fed cultivation can easily be attributed to the release of niche-specific groundnut varieties and associated improved production technologies developed through All India Coordinated Research Project on Oilseeds. Prior to 1970, only 25 groundnut varieties (9 Spanish bunch, 7 Virginia bunch, 8 Virginia runner, and 1 Valencia) were released. Post 1970, as many as 169 varieties have been released. Thus making a total of 194 varieties released so far. The new generation improved varieties were bred essentially for high yield and built-in resistance/tolerance to various biotic and abiotic stresses.

Agro-climatic zones

In order to derive maximum benefit from the climatic conditions in various groundnut growing areas, it was considered necessary to characterise these areas according to various agro-climatic zones. The analysis of rainfall-probability and water-balance during the growing seasons formed the basis of this characterization. In addition, parameters like photo-thermal units, heat units, sunshine hours, potential evapo-transpiration, length of rainy season, crop-growth period and biomass production were also be taken into account for identification and evaluation of agro-climatic zones. Accordingly, the groundnut growing areas in India have been characterised into five specific agro-climatic zones as described earlier in chapter 1 (Table 5a, b). Accordingly, the initial evaluation of the promising breeding material is done in all the five zones to identify the specific zone(s) for which a genotype (s) can be recommended/released.

Groundnut varietal development scenario in India

Although, groundnut was introduced into India in the 16th century, a systematic attempt for its improvement was made only in 20th century. During the last century, as many as 124 varieties (64 Spanish bunch, 5 Valencia, 33 Virginia bunch, and 22 Virginia runner) were released and notified. (Table 12). The actual number of varieties released may be a little more than 124 due to the release of varieties by certain states which have not yet proposed for notification. Except for "Spanish Improved" the information about the cultivars recommended for cultivation during the first three decades (till 1930's) of the past century is not documented properly.

Breeding methods adopted

Since groundnut is not native to India, the breeding efforts were initiated by introducing the varieties popular in other countries. Purposeful introduction of improved groundnut varieties in India was made by the then Madras State Government towards the end of nineteenth century. In 1884, the 'Mauritius' variety was introduced to Pondicherry and Madras from Mauritius; 'Spanish' and 'Virginia' from the United States of America and 'Small Japan' and 'Large Japan' from Japan in 1901-02. Three of these varieties gradually spread over the various parts of the country with variant names, viz., 'Peanuts', 'Spanish Peanuts' (variants of Spanish); 'Coromandal', 'Mauritius', 'Mozambique' (variants of 'Mauritius'); and 'Bold' (variant of Big Japan) and thus formed the basis of groundnut improvement programmes and research in India (Seshadri, 1962).

All the established methods for self-pollinated crops were employed for breeding new groundnut varieties (Table 13). A brief review of the various breeding methods employed for developing new groundnut is provided below.

Table 13. Breeding methods employed for developing groundnut varieties in India

S.No	Breeding method	No. of varieties developed
1	Introduction	3
2	Mass selection	29
3	Pureline selection	23
4	Pedigree	97
5	Bulk-pedigree	20
6	Modified bulk-pedigree	14
7	Single seed descent	1
8	Mutation	7
Total		194

Introduction of exotic varieties

A large number of basic genetic stocks have been introduced from different countries for breeding superior varieties for various Indian conditions. A few of these introductions by themselves proved good in some areas. Between 1947 and 1976, from Argentina, Brazil, Chile, China, Israel, Malawi, Sudan, Tanzania, USA, USSR, Zambia, etc., the introduction of a total of 2,246 genetic stocks of improved varieties, segregating populations and wild species of *Arachis* was channelized into India through the National Bureau of Plant Genetic Resources, New Delhi (Rao and Sadasivan, 1989). A collection of 18 *Arachis* species has also been obtained from these countries. In the early part of the last century (1904-1910), two varieties, 'Big Japan' and 'Spanish' were introduced. These varieties were very popular with the farmers for about two decades.

Some of the direct introductions released as varieties in India are Ah-32, Ah-334 (in Gujarat), 'Big Japan' and 'Early Runner' (in Bihar) and UF-70-103 (in Maharashtra). Although, the introduced genotypes, 'Asiriya Mwitunde' from Tanzania, 'Acholi White' from Uganda and 'Shulamit' from Israel were not released as varieties, they have been used as parents in hybridisation programme.

Selection

The groundnut genetic stocks being maintained in the national collection have already been evaluated for making selections for direct commercial cultivation. Selection as a method has extensively been utilised in the early years of groundnut breeding work. In Tamil Nadu, all the commercial varieties right from 'TMV 1' to 'TMV 8' and 'Pollachi 1' were the result of planned and purposeful selections.

Likewise, in Maharashtra commercial varieties 'Faizpur-1-5', 'Kopergaon-1' and 'Kopergaon-3', 'Spanish Improved', 'AK-12-24', 'Karad-4-11'; and in Punjab, 'Punjab-1' and 'M-13' are some of the noteworthy selections. A selection from 'Samrala Local', ('Punjab Groundnut-1') became quite popular in Punjab, Rajasthan and Gujarat and was one of the dominant varieties in these states during 1960s.

In Punjab, the variety 'M-13', was selected from 'NC-13' an accession from the USA. 'M-13', a Virginia runner variety, was released in 1972 for cultivation in all the groundnut zones of India. 'M-13' has bold seeds and was used for export for a long time. In Uttar Pradesh 'Type-64', a popular bold seeded, semi-spreading variety, was selected from the Chinese variety, 'Ta-Lin-Chin' (EC-16128) in 1964 and remained popular with the farmers for quite some time. Other useful selections in Uttar Pradesh were 'T-99', 'T-1' and 'T-28'.

In Rajasthan 'RS-87' has been developed from a genetic stock obtained from Brazil. In Maharashtra, 'JL-24' (Phule Pragati), a pure line selection from the exotic germplasm 'EC-94943' has been released for commercial cultivation. It became a national variety due to its wide adaptability and superior yields and is still popular among the farmers of the southern states of the country. In Tamil Nadu, 'TMV-10' a semi-spreading variety has been selected from a spontaneous mutant plant of an Argentinean variety. Likewise, in Haryana, the commercial variety, 'MH-1' has been developed from 'Dwarf Mutant'. The number of varieties released so far through selections is 52 (29 mass selections and 23 pure line selections).

Hybridisation

The recombination breeding did not gain much attention in groundnut till 1960s'. The first cross-derivative 'c-501', developed by PAU, Ludhiana, was released in 1961. Compared to other field crops, hybridisation is rather difficult in groundnut due to cleistogamous nature of its flowers and poor rate of success. Notwithstanding these limitations, hybridisation has been successfully employed to recombine desirable characters occurring in various genotypes and in this way so far a total of 114 commercial varieties have been developed. Among the early maturing Spanish bunch types 'Junagadh-11', 'GAUG-1', and 'TMV-9' are some of the products of planned hybridisation programmes. The variety 'Junagadh-11' was released in 1965 for commercial cultivation in Gujarat.

In Virginia runner types 'GAUG-10' and 'M-145' have been developed through hybridisation. The former was popular in Gujarat while the latter was released as a commercial variety for Punjab and Haryana. For rain-fed areas of Punjab, 'M-37' was released in 1980. A large number of varieties have been developed through hybridisation in the recent years following either the pedigree method or its modifications (pedigree method-97; bulk pedigree-20; modified bulk pedigree-14; single seed descent-1; Table 13)

Mutation breeding

Mutation breeding has frequently been used for creating additional genetic variability in groundnut and to induce expression of one or more desirable characters without practically disturbing the agronomic attributes of the base material. Considerable success has been achieved through this method at the North Carolina (USA) and in India at Bhabha Atomic Research Centre, Trombay, Bombay by using X-rays and g-rays.

During 1957-58, a mutation-breeding project was initiated at BARC, Trombay. 'Spanish Improved', a popular variety at that time, was used as the base material. Since then a number of promising Trombay groundnut (TG) varieties have been developed through mutation, selection and further hybridisation. The variety, 'TG-1', developed by treating the seeds of 'Spanish Improved' with 75 Kr X-rays, has bold-seeds (85g/100 seeds); the variety, 'TG-3' has medium-bold seeds (50g/100 seeds) and a few other varieties, 'TG-1', 'TG-3' 'TG-17', 'Somnath' and 'TPG-41' also have bold seeds (>50g 100 seeds) and are suitable for production of export grade groundnuts.

At the Rajendra Agricultural University, Ranchi, two selections ('BG-1' and 'BG-2') have been developed through mutation breeding using X-rays. These selections were once quite popular in Chota Nagpur plateau of Bihar. A few other varieties, TMV-10 (natural mutant), CO-2 (EMS) from Tamil Nadu, and MH-2 (γ -ray) from Haryana, have also been bred in India using mutations followed by selection.

Interspecific hybridisation

The wild species of groundnut offer a vast reservoir of valuable genes that are not available in the cultivated species. Though, as early as in 1950, the development of first successful interspecific hybrid was reported (Krapovickas and Rigoni, 1951), it was only during 1966 that the utilisation of wild species on a large scale for groundnut improvement was suggested (Abdou, 1966). In India, utilisation of wild species was confined mainly to cytogenetic studies till the end of 20th century. The beginning of the new millennium marked the release of first groundnut variety, 'GPBD-4' of interspecific origin {KRG-1 $\times$ *A. cardinasii* (ICGV-86855)}. In the USA, two varieties namely, 'Span Cross' (*A. hypogaea* $\times$ *A. monticola*) and 'Tamnut' (Spantex $\times$ *Arachis* sp.) have been released so far.

The immediate use of crosses with wild species is restricted due to a high degree of sterility encountered in the progenies of interspecific crosses with the compatible wild species of section *Arachis*; cross-incompatibility between cultivated and the wild species of sections other than *Arachis*; very low seed set in F_1 s coupled with high frequency of aneuploid individuals in the subsequent segregating generations and the consequent time lag in developing varieties with acceptable pod and seed characters. Nevertheless, many interspecific hybrid derivatives developed by ICRISAT and the national system (NARS and DGR) have been found to be quite useful as sources of resistance/tolerance to many important pests and diseases of groundnut.

Breeding emphasis and accomplishments

A) Yield improvement

Like in any other crop, enhancement of yield is the primary objective of groundnut breeding. However, it appears that yield improvement in most groundnut growing states in India was brought about through a progressive improvement in pod size of the new varieties (Reddy, 1988) and number of pods, pod and seed size (Rathnakumar *et al.* 2010). For example the pod weight increased from 68g in PG-1 (1953) to 100g in c-501 (1961), to 120g in M-13 (1972), and to 119g in M-37 (1982) in Punjab; from 76g in RS-1 (1953) to 103g in RSB-87 (1961) in Rajasthan; from 80g in T-28 (1960) to 118g in Chandra (1977) in Uttar Pradesh; from 72g in AK-12-24 (1940) to 75g in SB-XI (1965), 119g in JL-24 (1978) 120g in TG-17 (1982) and 127g in UF-70-103 (1984) in Maharashtra; from 52g in Kadiri-71-1 (1971) to 91g in Kadiri-2 (1978) and Kadiri-3 in Andhra Pradesh; from 77g in s 206 (1969) to 88g in Dh-3-30 (1975) in Karnataka and from 76g in TMV-2 (1940) to 91g in TMV-7 (1967) and 92g in TMV-9 (1970) in Tamil Nadu (Reddy, 1988).

Over the years, the yield improvement in groundnut has also been achieved through progressive increase in seed size. For example, during 1940-50, the varieties had small seeds in the range of 29.4g/100 seeds (AK-12-24) to 36.6g/100 seeds (TMV 3 and TMV 4). Whereas after four decades, the average seed size of the varieties were medium (44.8 g/100 seeds) with a range of 27g/100 seeds (Pragathi) to 90 g/100 seeds (B-95). During the previous decade (2001-10), the average seed size of the varieties remained medium (47.9 g/100 seeds).

B) Situation/location specific varieties

In the past, breeding of new varieties in India was exercised mainly for *kharif* situations. For *rabi*-summer season, the farmers adopted certain varieties from amongst the varieties developed for cultivation in *kharif*. Subsequently, breeding programmes aimed at developing varieties specifically for *rabi*-summer season was taken up in 1990s and as a result several Spanish type of varieties have been released exclusively for cultivation in *Rabi*-summer. The important ones are GG-2, TG-17, UF-70-103, Dh-40, ICGS-11, ICGS-44, RSHY-1, OG 52-1, TAG-24, TG-26, TG-38B, BSR-1, Dh-86, Dh-101, R-8808, TG-37A and TG-51. Among Virginia varieties, 'Karad-4-1' (spreading type) and Kadiri-3 (semi-spreading type) are noteworthy. A Comprehensive list of latest improved varieties suitable for different states and niches are provided in the Annexure IIIa and IIIb.

C) Stress tolerance

a) Biotic stress tolerance

Among the biotic stresses, the foliar fungal diseases (early leaf spot, late leaf spot, rust, *Alternaria*), viral diseases (peanut bud necrosis disease, PBNB; peanut stem necrosis disease, PSND) soil borne diseases (stem rot, collar rot and pod rot complexes), and the insect pests like defoliators (*Spodoptera*, *Helicoverpa*, red hairy caterpillar and leaf miner) and sucking pests (jassids, aphids, and thrips) are the major ones that limit groundnut productivity. In addition, the pre- and post-harvest invasion by the fungi of *Aspergillus* group, which produce aflatoxins, lower the quality of produce which is regarded as the major hurdle in enhancing export of processed groundnut from India.

Since inception of the AICORPO in 1967-68, a total of 169 varieties have been developed and released till 2013 (up to July 2013) for cultivation. Of these varieties, several are endowed with resistance/tolerance to major insect pests and diseases while some are endowed high water-use-efficiency or high partitioning efficiency. Some varieties are suitable for acid soils. A list of groundnut varieties possessing one or more desirable traits recommended for different states is given in Annexure IV.

b. Abiotic stress tolerance

i) Drought

Drought is the major yield limiting factor in groundnut as 80% of the crop is grown as rainfed in *kharif* season. Breeding for drought tolerance is most challenging, as the stage of occurrence of drought in the life cycle of the crop; its intensity and duration are unpredictable. However, based on stage of occurrence, the drought pattern can be grouped in to: early, mid and end-of-season or terminal drought although these patterns overlap and confound the breeding strategies.

For many years, pod yield was the sole criterion to select a drought tolerant genotype. However, through the collaborative research project of ICAR-ICRISAT-ACIAR, on breeding for improved water use efficiency in groundnut which was in operation for over a decade in India, three physiological traits, viz., specific leaf area (SLA, which is indicative of leaf thickness) and SPAD Chlorophyll Meter Reading (SCMR, which measures the chlorophyll concentration) have been found to be associated with water use efficiency while Carbon Isotope Discrimination ($\Delta^{13}\text{C}$, an indirect measure of transpiration efficiency) have been identified as surrogate traits and suggestive of the utility of these traits in screening and selection of drought tolerant genotypes in breeding programme.

However, drought tolerance *per se* is not an independent trait but is a manifestation of interplay of several anatomical, morphological, physiological and biochemical factors with the environment. Hence, more traits which can possibly capture the true tolerance need to be identified for increasing the efficiency of selection in the breeding programme. Some of the drought tolerant varieties released in India are: Kadiri-3, K-134, ICGS-1 (ICGV-87119), ICGS-5 (ICGV-87121), ICGS-37 (ICGV-87187) and ICGS-76 (ICGV-87141), ICGV-86031 and TAG-24, though these were not exclusively bred for drought tolerance but were found to possess tolerance also. Recently few improved and drought tolerant varieties have also been developed based on targeted breeding approach and released for cultivation in different states. These include: ICGV-91114, Kadiri-7, Abhaya, Prasuna (for Andhra Pradesh), Co (Gn)-6, TMV-13 and VRI (Gn)-7 (for Tamil Nadu), and ICGV-91114 and R-2001-3 (for Karnataka).

ii) High temperature

Groundnut yields are frequently affected by heat and water deficit stress. Considerable research has been conducted on drought tolerance in groundnut, but there has been little research on the effect of high temperature *per se*.

The optimum temperature for groundnut is between 25 and 30°C for growth processes and 28 to 33°C for developmental processes (flowering and maturity). However, the 'base temperature (T_0)' has been precisely determined only for a few aspects of growth and development. Daily and mean diurnal temperatures warmer than 30°C are frequently experienced in semi-arid tropical environments. Continuous exposure to supra-optimal temperature has been reported to reduce apparent photosynthesis; vegetative growth and leaf area; partitioning of dry matter between roots and shoots and between vegetative and reproductive structures (Nigam *et al.* 1994), and water use efficiency (Craufurd *et al.* 1999). Reproductive processes in groundnut are also sensitive to temperature; high temperature increases flower production but reduces pollen viability and number of fruits, and fruit-set. The critical day temperature for reproductive processes is about 36°C. However, reported temperature optima for different growth stages in the literature are based mainly on controlled conditions. While under field conditions, light, photoperiod and temperature interact with each other and confound screening of genotypes for heat

tolerance. A few heat tolerant genotypes of groundnut have been reported which include ICGS-44, ICGS-76, ICGV-86031, K-134, K-1240, Kadiri-3, JL-24, TG- 22 and CSMG-84-1. A few donors (796, 55-437, ICG-1236, ICGV-86021, ICGV-87281, and ICGV-92121, TNAU-325, ICG-1236, ICG-3793 and Chico) have also been identified for tolerance to heat.

iii) Acid soils

Groundnut is grown on acid soils in about 18 million ha around the world with productivity of about 500 kg/ha. Acid soils are deficient mainly in calcium and magnesium which leads to poor pod filling (occurrence of 'pops' or empty pods) and low yields. In addition, these soils cause toxicity of Al, Fe, and Mn and are deficient of P, K, B and Mo.

Extensive screening of genotypes in acid soils (sandy loam; pH 4.5-6.0) over years has been carried out in eastern and north-eastern parts of India by the Directorate of Groundnut Research, Junagadh. The varieties found promising in different north-eastern states are: ICGS-76, ICGS-11, ICGS-86590, ICGS-44, RSHY-1, Girnar-1, GG-2, BAU-13, TKG-19A, OG-52-1, and DRG-12. A few varieties have also been released for eastern and north-eastern states. These include: TG-38B, Dh-101, TG-51, R-2001-3, and GPBD-5. Certain germplasm accessions (NRCG-7599, 1038, 3498 and FeESG-8) have also been identified for tolerance of Al toxicity in these regions.

Excellent screening work done in the copper belt of Zambia which has resulted in release of the pop-tolerant line 'TMV 1, as 'Copper Belt Runner'. This variety was in fact developed and released by the state of Tamil Nadu in 1940. However, breeding for tolerance of acid soil is very complex, as the soil acidity may be associated with deficiency or toxicity of various nutrients depending on location. Identification of parents which can tolerate higher levels of acidity is required to be intensified especially in the problem areas for use as donors in breeding programme.

7. Habit group-wise details of varieties released

A detailed habit group-wise list of varieties of regional and multi-regional importance along with pedigree, breeding method employed, area of adoption, recommended season, yields, oil content days to maturity, distinguishing and special features if any are given below.

A. Habit group: Spanish Bunch

1. Spanish Improved

Year of release	1905
Notification number	Released by Government of ex-Bombay state later notified vide S.O. 371(E) dated 29.05.1982
Developed by	UAS, Dharwad
Pedigree	Selection from 'Spanish Peanut'
Breeding method	Mass selection
Area of adoption	Tract of Bombay and Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,400
Kernel yield (kg/ha)	1,608
Oil content (%)	44.0
Days to maturity	106
Distinct morphological feature	Kernels small, round; salmon testa
Special feature	Tolerant of ELS; drought tolerant



2. AK-12-24



Year of release	1940
Notification number	Released by Government of ex-Bombay state later notified vide S.O. 361(E) dated 30.06.1973 and S.O. 786 02.02.1976
Developed by	PKV, Akola
Pedigree	Selection from 'local'
Breeding method	Mass selection
Area of adoption	Vidharbha region of Maharashtra, Orissa, Madhya Pradesh and Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,250
Kernel yield (kg/ha)	938
Oil content (%)	49.0
Days to maturity	104
Distinct morphological feature	Kernels small with rose colour testa
Special feature	Wider adaptability; suitable for medium to heavy soils

3. TMV-2 (A.H.-32)

Year of release	1940
Notification number	Released by Government of ex-Madras state subsequently notified vide S. O. 786 dated 02.02.1976
Developed by	TNAU, Tindivanam
Pedigree	Selection from "Gudhiyatham bunch"
Breeding method	Mass selection
Area of adoption	Tamil Nadu, Andhra Pradesh and Karnataka
Recommended production system	<i>Kharif</i> and <i>rabi</i> summer
Pod yield (kg/ha)	1,025 (<i>kharif</i>)
Kernel yield (kg/ha)	786 (<i>kharif</i>)
Oil content (%)	49.0
Days to maturity	106
Distinct morphological feature	Kernels small with salmon colour testa
Special feature	Widely adapted



4. TMV-5

Year of release	1950
Notification number	Released by Government of ex-Madras state but withdrawn subsequently
Developed by	TNAU, Tindivanam
Pedigree	Native Tanganiyaka x Gudhiyatham bunch
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,250
Kernel yield (kg/ha)	933
Oil content (%)	51.0
Days to maturity	110
Distinct morphological feature	Leaflets light green, large, oblong; 2-1 seeded; rose testa
Special feature	Possesses fresh seed dormancy

5. J-11 (Junagadh-11)



Year of release	1964
Notification number	Originally released from Junagadh but subsequently released and notified by Jalgaon under Government of ex-Maharashtra state vide S.O. 4045 dated 24.09.1969
Developed by	JAU, Junagadh
Pedigree	Ah-4218 x Ah-4354
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i> and summer
Pod yield (kg/ha)	1,300 (<i>kharif</i>)
Kernel yield (kg/ha)	975 (<i>kharif</i>)
Oil content (%)	49.0
Days to maturity	104
Distinct morphological feature	Pods small, thin shelled; kernels medium in size with salmon colour testa
Special feature	Tolerant of collar rot and <i>Aspergillus flavus</i> seed colonization

6. SB-XI

Year of release	1965
Notification number	Originally released from Junagadh but subsequently released and notified by Jalgaon under Government of ex-Maharashtra state vide S.O. 4045 dated 24.9.1969
Developed by	MPKV, Jalgaon
Pedigree	Ah-4213 x Ah-4354
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i> and summer
Pod yield (kg/ha)	1,300 (<i>kharif</i>)
Kernel yield (kg/ha)	975 (<i>kharif</i>)
Oil content (%)	49.0
Days to maturity	104
Distinct morphological feature	Kernels medium in size with light pink testa
Special feature	Tolerant of collar rot and <i>Aspergillus flavus</i> seed colonization



7. TMV-7



Year of release	1967
Notification number	Released by Government of ex-Madras state and notified later vide S.O. 440(E) dated 21.08.1975 and S.O. 540(E) dated 24.07.1985
Developed by	TNAU, Tindivanam
Pedigree	Selection from 'Tennessee white'
Breeding method	Pure line selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,400
Kernel yield (kg/ha)	1,053
Oil content (%)	50.0
Days to maturity	108
Distinct morphological feature	Pods medium bold with prominent beak; salmon testa
Special feature	High shelling (75%); drought tolerant

8. Pollachi-1

Year of release	1968
Notification number	Released by Government of ex-Madras state and notified later vide S.O. 440 dated 21.08.1975 and S.O. 786 dated 02.02.1976
Developed by	TNAU, Aliyarnagar
Pedigree	Selection from 'Malaysian bunch variety'
Breeding method	Pure line selection
Area of adoption	Pollachi tract of Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,450
Kernel yield (kg/ha)	1,111
Oil content (%)	48.0
Days to maturity	107
Distinct morphological feature	Pods bold; kernels with light rose testa
Special feature	High shelling (74%); seeds HPS grade, suitable for export

9. S-206 (Selection-206)

Year of release	1969
Notification number	S.O. 19(E) dated 14.01.1982
Developed by	UAS, Raichur
Pedigree	Selection from 'Manvi local'
Breeding method	Pure line selection
Area of adoption	Northern Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,900
Kernel yield (kg/ha)	1,387
Oil content (%)	50.0
Days to maturity	105
Distinct morphological feature	Leaflets dark green, elliptical; pods reticulated with slight beak and constriction
Special feature	High shelling (73%)



10. TMV-9



Year of release	1970
Notification number	Released by Tamil Nadu state
Developed by	TNAU, Tindivanam
Pedigree	Ah-3490 x Ah-477
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,512
Oil content (%)	51.0
Days to maturity	105
Distinct morphological feature	Pods medium sized; rose testa
Special feature	Possesses fresh seed dormancy (up to 15 days)

11. Jyoti (KG-61-240)

Year of release	1971
Notification number	S.O. 786 dated 02.02.1976
Developed by	JNKVV, Khargone
Pedigree	Selection from 'Exotic-7'
Breeding method	Mass selection
Area of adoption	Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,600
Kernel yield (kg/ha)	1,245
Oil content (%)	53.0
Days to maturity	110
Distinct morphological feature	Leaflets large, oblong, light green
Special feature	High shelling (78%), protein (21%) and oil (53%) contents; responsive to higher doses of fertilisers



12. Kuber

Year of release	1972
Notification number	S.O. 13 dated 19.12.1978
Developed by	-
Pedigree	Selection from introduced culture 'ECO-1704'
Breeding method	Introduction
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,000-1,400
Kernel yield (kg/ha)	-
Oil content (%)	-
Days to maturity	80-90
Distinct morphological feature Special feature	Possesses field tolerance to collar rot and LLS



13. GAUG-1 (J-113)

Year of release	1973
Notification number	S.O. 499(E) dated 08.07.1983
Developed by	JAU, Junagadh
Pedigree	AK-10 x AK-12-24
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,500
Kernel yield (kg/ha)	1,140
Oil content (%)	50.0
Days to maturity	95 -105
Distinct morphological feature	Pods small, thin shelled with prominent beak
Special feature	Early maturity

14. Pollachi-2

Year of release	1973
Notification number	Notified vide S.O. 13 dated 19.12.1978 and denotified vide S.O. 424 dated 08.06.1999
Developed by	TNAU, Aliyarnagar
Pedigree	Pollachi Red x Ah-2105
Breeding method	Pedigree method
Area of adoption	Coimbatore, Salem and Trichy districts of Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,500 (<i>kharif</i>); 2700 (<i>rabi</i>)
Kernel yield (kg/ha)	1,179 (<i>kharif</i>); 2122 (<i>rabi</i>)
Oil content (%)	49.0
Days to maturity	105
Distinct morphological feature	Leaflets large, elliptic, green
Special feature	High shelling (76%)

15. Dh-3-30

Year of release	1975
Notification number	S.O. 19(E) dated 14.01.1982
Developed by	UAS, Dharwad
Pedigree	Spanish Improved x US-4
Breeding method	Pedigree method
Area of adoption	Northern Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,800
Kernel yield (kg/ha)	2,173
Oil content (%)	47.0
Days to maturity	107
Distinct morphological feature	Pods with prominent beak and constriction
Special feature	Drought tolerant



16. MH-1 (Moongphali Haryana No. 1)



Year of release	1975
Notification number	Haryana State release
Developed by	HAU, Hissar
Pedigree	Selection from 'Faizpur 1-5'
Breeding method	Selection
Area of adoption	Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,400
Oil content (%)	50.0
Days to maturity	104
Distinct morphological feature	Light green leaflets; pods small; light rose testa
Special feature	Dwarf plant type

17. Phule pragati (JL-24)

Year of release	1978
Notification number	S.O. 596(E) dated 13.08.1984
Developed by	MPKV, Jalgaon
Pedigree	Selection from 'EC-94943'
Breeding method	Mass selection
Area of adoption	Maharashtra and Gujarat but adapted to entire country
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,800
Kernel yield (kg/ha)	1,350
Oil content (%)	51.0
Days to maturity	95 -106
Distinct morphological feature	Large, green leaflets; smooth pods; light rose testa
Special feature	Early maturity; wider adaptability



18. TMV-12

Year of release	1978
Notification number	S.O. 19(E) dated 14.01.1982
Developed by	TNAU, Tindivanam
Pedigree	Selection from 'Ugandan culture'
Breeding method	Pure line selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,250 (<i>kharif</i>); 2,100 (<i>rabi</i>)
Kernel yield (kg/ha)	900 (<i>kharif</i>); 1,512 (<i>rabi</i>)
Oil content (%)	51.0
Days to maturity	105
Distinct morphological feature	Pods medium to bold with shallow constriction
Special feature	Tolerant of rust and LLS



19. Co-1



Year of release	1979
Notification number	Notified vide S.O. 19(E) dated 14.01.1982 and denotified vide S.O. 424 dated 08.06.1999
Developed by	TNAU, Coimbatore
Pedigree	Ah-6279 x TMV-3
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,300 (<i>kharif</i>); 2,100 (<i>rabi</i>)
Kernel yield (kg/ha)	962 (<i>kharif</i>); 1,554 (<i>rabi</i>)
Oil content (%)	50.0
Days to maturity	103
Distinct morphological feature	Pods medium bold; salmon testa
Special feature	High harvest index; possesses fresh seed dormancy (up to 15 days)

20. Kisan

Year of release	1980
Notification number	S.O. 832(E) dated 18.11.1985
Developed by	OUA&T, Chiplima
Pedigree	Spanish Improved x B-31
Breeding method	Pedigree method
Area of adoption	Orissa
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,600
Kernel yield (kg/ha)	1,133
Oil content (%)	50.0
Days to maturity	105
Distinct morphological feature	Small pods with prominent reticulation
Special feature	Tolerant of LLS



21. KRG-1

Year of release	1981
Notification number	S. O. 499(E) dated 08.07.1983
Developed by	UAS, Raichur
Pedigree	Selection from 'Argentina variety'
Breeding method	Mass selection
Area of adoption	Raichur, Bellary and Gulbarga districts of Karnataka
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,200 (<i>kharif</i>); 2,230 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	876 (<i>kharif</i>); 1,701 (<i>rabi</i> -summer)
Oil content (%)	49.0
Days to maturity	105
Distinct morphological feature	-
Special feature	Suitable for <i>rabi</i> -summer season also



22. TG-17



Year of release	1982
Notification number	S.O. 832(E) dated 18.11.1985
Developed by	BARC, Trombay
Pedigree	Dark green mutant x TG-1
Breeding method	Mutation
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i> and summer
Pod yield (kg/ha)	1,132 (<i>kharif</i>); 2,000 (summer)
Kernel yield (kg/ha)	781 (<i>kharif</i>); 1,380 (summer)
Oil content (%)	49.0
Days to maturity	120-125
Distinct morphological feature	Compact dwarf plant; bold pods; kernels HPS grade (60-70 g/100 kernel)
Special feature	Possesses fresh seed dormancy (up to 30 days)

23. GG-2 (Gujarat Groundnut-2)

Year of release	1983
Notification number	S.O. 295(E) dated 09.04.1985
Developed by	JAU, Junagadh
Pedigree	J-11 x EC-16659
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i> and summer
Pod yield (kg/ha)	3,100 (summer)
Kernel yield (kg/ha)	2,186 (summer)
Oil content (%)	49.0
Days to maturity	105
Distinct morphological feature	Leaflets green; pods medium sized; rose testa
Special feature	Water use efficient



24. Jawan (OG-71-3)

Year of release	1983
Notification number	S.O. 867(E) dated 26.11.1986
Developed by	OUA&T, Chiplima
Pedigree	J-11 x Asiriya Mwitunde
Breeding method	Pedigree method
Area of adoption	Orissa
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,230 (<i>kharif</i>); 2,000 (<i>rabi</i>)
Kernel yield (kg/ha)	815 (<i>kharif</i>); 1,326 (<i>rabi</i>)
Oil content (%)	48.0
Days to maturity	91-110
Distinct morphological feature	Pods elongated with prominent beak; rose testa
Special feature	Early maturity



25. Co-2

Year of release	1983
Notification number	S.O. 258(E) dated 14.05.1986
Developed by	TNAU, Coimbatore
Pedigree	EMS mutant of variety 'Pollachi-1'
Breeding method	Mutation
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,650 (<i>kharif</i>); 2,700 (<i>rabi</i>)
Kernel yield (kg/ha)	1,271 (<i>kharif</i>); 2,079 (<i>rabi</i>)
Oil content (%)	51.0
Days to maturity	105 -110
Distinct morphological feature	Medium bold pods, 2-1 seeded; rose testa
Special feature	Tolerant of ELS, LLS and rust

26. Jawahar Moongphali-2 (JGN-2)

Year of release	1983
Notification number	S.O. 499(E) dated 08.07.1983
Developed by	JNKVV, Khargone
Pedigree	Selection from 'Exotic-1'
Breeding method	Mass selection
Area of adoption	Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,600
Kernel yield (kg/ha)	1,200
Oil content (%)	52.0
Days to maturity	115
Distinct morphological feature	Rose testa
Special feature	Drought tolerant

27. Dh-8

Year of release	1984
Notification number	State release
Developed by	UAS, Dharwad
Pedigree	Selection from 'RS-144'
Breeding method	Pure line selection
Area of adoption	Transitional tract of northern Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	3,200
Kernel yield (kg/ha)	2,294
Oil content (%)	46.0
Days to maturity	105
Distinct morphological feature	Compact plant; kernel round shaped at one end and sharply pointed towards the other
Special feature	Tolerant of LLS; possesses fresh seed dormancy



28. TG-3



Year of release	1985
Notification number	S.O. 165(E) dated 06.03.1987
Developed by	BARC, Trombay
Pedigree	g-ray mutant of the variety 'Spanish Improved'
Breeding method	Mutation
Area of adoption	Originally for Kerala; became popular in Maharashtra, Gujarat, Madhya Pradesh, Karnataka
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,200 (<i>kharif</i>)
Kernel yield (kg/ha)	816 (<i>kharif</i>)
Oil content (%)	48.0-52.0
Days to maturity	110-115
Distinct morphological feature	Pods medium sized, reticulated, constricted
Special feature	Tolerant of ELS and pod borer

29. ICGS-11 (ICGV-87122)

Year of release	1986
Notification number	S.O. 867(E) dated 26.11.1986
Developed by	ICRISAT, Hyderabad
Pedigree	Selection from 'Robut-33-1'
Breeding method	Pure line selection
Area of adoption	Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,400
Oil content (%)	49.0
Days to maturity	120
Distinct morphological feature	Compact plant type; leaflets dark green, elliptic, medium; pods smooth without beak
Special feature	Tolerant of PBND and end-of-season drought; photo-period insensitive



30. SG-84 (Spring Groundnut-84)

Year of release	1986
Notification number	S.O. 165(E) dated 06.03.1987
Developed by	PAU, Ludhiana
Pedigree	Selection from 'ICGS-1 (ICGV 87119)'
Breeding method	Pure line selection
Area of adoption	Punjab
Recommended production system	Spring season
Pod yield (kg/ha)	2,062
Kernel yield (kg/ha)	1,320
Oil content (%)	50.0
Days to maturity	104
Distinct morphological feature	Leaflets medium, dark green elliptic; pods smooth; kernels with tan colour testa
Special feature	Tolerant of LLS and rust



31. VRI-1

Year of release	1986
Notification number	S.O. 10(E) dated 01.01.1988
Developed by	TNAU, Vriddhachalam
Pedigree	TMV-7 x FSB-7-2
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,590 (<i>kharif</i>); 1,877 (<i>rabi</i> summer)
Kernel yield (kg/ha)	1,177 (<i>kharif</i>); 1,389 (<i>rabi</i> summer)
Oil content (%)	48.0
Days to maturity	105
Distinct morphological feature	Pods medium bold, constricted, reticulated with prominent beak; rose testa
Special feature	Possesses fresh seed dormancy (up to 7 days); tolerant of ELS, LLS and rust

32. Girnar-1 (CGC-4018)



Year of release	1988
Notification number	S.O. 471(E) dated 05.05.1988
Developed by	NRCG, Junagadh
Pedigree	X-14-4-B-19-B x NCAC-17090
Breeding method	Pedigree method
Area of adoption	All India
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,418
Oil content (%)	49.0
Days to maturity	100-105
Distinct morphological feature	Leaflets dark green, obovate, waxy; pods reticulated, constricted, beaked
Special feature	Early maturity; multiple diseases (ELS, LLS, rust, collar rot, <i>Aspergillus flavus</i>) resistant; possesses high peg strength

33. ICGS-44 (ICGV-87128)

Year of release	1988
Notification number	S.O. 471(E) dated 05.05.1988
Developed by	ICRISAT, Hyderabad
Pedigree	Robut-33-1-1-5-B1-B1-B1-B1-B1 (Selection from natural hybrid population of Robut 33-1)
Breeding method	Selection
Area of adoption	Gujarat; became popular in Andhra Pradesh, Karnataka, Orissa and Tamil Nadu
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,500
Kernel yield (kg/ha)	1,750
Oil content (%)	49.0
Days to maturity	107
Distinct morphological feature	Pods smooth, small to medium, with slight to moderate constriction; kernels bold with tan testa
Special feature season	Tolerant of ELS; field tolerant of PBNB and mid-drought; possesses high seed protein (25%) content



34. VRI-2



Year of release	1989
Notification number	S.O. 915(E) dated 06.11.1989
Developed by	TNAU, Vriddhachalam
Pedigree	JL-24 x CO-2
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	1,500 (<i>kharif</i>); 2,000 (<i>rabi</i>)
Kernel yield (kg/ha)	1,110 (<i>kharif</i>); 1,480 (<i>rabi</i>)
Oil content (%)	48.0
Days to maturity	105
Distinct morphological feature	Bold reticulated pods with prominent beak; rose testa
Special feature	Tolerant of ELS, LLS and rust

35. RG-141

Year of release	1989
Notification number	S.O. 527(E) dated 16.08.1991
Developed by	RAU, Durgapura
Pedigree	Robut-33-1 x NCAC-2821
Breeding method	Bulk pedigree method
Area of adoption	Black soil areas of Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,512
Oil content (%)	50.8
Days to maturity	105
Distinct morphological feature	Medium sized pods, shallow constriction; pink testa
Special feature	Tolerant of LLS and PBNB



36. ICGS-1 (ICGV-87119)

Year of release	1990
Notification number	S.O. 386(E) dated. 15.05.1990
Developed by	ICRISAT, Hyderabad
Pedigree	Selection from 'Robut-33-1'
Breeding method	Selection
Area of adoption	Uttar Pradesh, Bihar, Haryana, Punjab, Rajasthan
Recommended production system	<i>Kharif</i> and spring
Pod yield (kg/ha)	2,300 (<i>kharif</i>)
Kernel yield (kg/ha)	1,610 (<i>kharif</i>)
Oil content (%)	51.0
Days to maturity	105 -112
Distinct morphological feature	Small to medium, dark green, elliptic leaflets; tan testa
Special feature	Tolerant of mid-season drought, leaf spots and PBND



37. ICG (FDRS)-10 (ICGV-87160)



Year of release	1990
Notification number	S.O. 386(E) dated 15.05.1990
Developed by	ICRISAT, Hyderabad
Pedigree	Ah-65 x NCAC-17090
Breeding method	Bulk pedigree method
Area of adoption	Andhra Pradesh, Karnataka, Kerala, southern Maharashtra, Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,475
Oil content (%)	47.8
Days to maturity	115
Distinct morphological feature	2- seeded stubby pods with prominent reticulation; kernels bold with tan colour testa
Special feature	Resistant to rust, LLS and PBND; adapted to low input rainfed cultivation

38. VRI-3 (VG-55)

Year of release	1990
Notification number	S.O. 793(E) dated 22.11.1991
Developed by	TNAU, Vriddhachalam
Pedigree	J-11 x Robut-33-1
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,668
Kernel yield (kg/ha)	1,251
Oil content (%)	49.0
Days to maturity	90 -95
Distinct morphological feature	Small pods with little or no beak, 3 seeded; light rose testa
Special feature	Early maturity; suitable for delayed south-west monsoon; tolerant of ELS, LLS, rust; suitable as an intercrop with sugarcane and tapioca



39. ICGS-37 (ICGV-87187)

Year of release	1990
Notification number	S.O. 639(E) dated 17.08.1990
Developed by	ICRISAT, Hyderabad
Pedigree	Robut-33-1-1-1-B1-B1-B1-B1 (Selection from natural hybrid population of Robut-33-1)
Breeding method	Selection
Area of adoption	Gujarat, northern Maharashtra, Madhya Pradesh
Recommended production system	Summer
Pod yield (kg/ha)	3,000
Kernel yield (kg/ha)	2,100
Oil content (%)	48.0
Days to maturity	110 -120
Distinct morphological feature	Medium sized pods; tan testa
Special feature	Tolerant of end-of-season drought; photo-period insensitive; tolerant of LLS, rust and PBNB



40. Pragathi (RSHY-1)

Year of release	1991
Notification number	S.O. 793(E) dated. 22.11.1991
Developed by	IARI, Hyderabad
Pedigree	Selection from 'Spanish Mutant-1'
Breeding method	Selection
Area of adoption	Orissa and coastal Andhra Pradesh
Recommended production system	<i>Rabi</i>
Pod yield (kg/ha)	2,480
Kernel yield (kg/ha)	1,810
Oil content (%)	50.0
Days to maturity	110-120
Distinct morphological feature	Very small seeded (27 g/100 kernel) with rose colour testa
Special feature	Tolerant of LLS, rust, PBNB; suitable for <i>rabi</i> residual moisture situation

41. TAG - 24



Year of release	1991
Notification number	S.O. 814(E) dated 04.11.1992
Developed by	BARC, Trombay
Pedigree	Selection from TGS-2 (TG-18A x M 13) x TGE-1 (Tall mutant x TG-9)
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i> and summer
Pod yield (kg/ha)	1,683 (<i>kharif</i>); 2,493 (summer)
Kernel yield (kg/ha)	1,178 (<i>kharif</i>); 1,745 (summer)
Oil content (%)	51.0
Days to maturity	102
Distinct morphological feature	Semi-dwarf plant type; pods medium sized, slightly reticulated, with moderate beak, occasionally 3 seeded; light rose testa
Special feature	Early maturity; high harvest index (50-55%)

42. Tirupati-2

Year of release	1991
Notification number	S.O. 527(E) dated 16.08.1991
Developed by	APAU, Tirupati
Pedigree	GAUG-1 x NCAC FLA-14
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i>
Pod yield (kg/ha)	2,100 (<i>kharif</i>); 3,500 (<i>rabi</i>)
Kernel yield (kg/ha)	1,617 (<i>kharif</i>); 2,695(<i>rabi</i>)
Oil content (%)	49.0
Days to maturity	105-115
Distinct morphological feature	Leaflets large, light green; pods medium sized; spheroidal kernels; salmon testa
Special feature	Possesses high peg strength; tolerant of nematode incidence ('kalahasti' malady)



43. ICGV-86590 (ICGS-86)



Year of release	1991
Notification number	S.O.793(E) dated 22.11.1991
Developed by	ICRISAT, Hyderabad
Pedigree	(X14-4-B-19-B x P1-259747) -F2-B2-B1-B1-B1-B1-B2
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh, Karnataka, Kerala, southern Maharashtra, Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,785
Kernel yield (kg/ha)	1,107
Oil content (%)	48.0
Days to maturity	108
Distinct morphological feature	Pods with prominent reticulation and beak, occasionally 3 seeded
Special feature	Multiple diseases (rust, LLS, PBND, stem and pod rots and insect pest (<i>Spodoptera litura</i>) resistant

44. TG-22

Year of release	1992
Notification number	S.O. 636(E) dated 02.09.1994
Developed by	BARC, Trombay
Pedigree	Robut-33-1 x TG-17
Breeding method	Pedigree method
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,677
Kernel yield (kg/ha)	1,207
Oil content (%)	49.0
Days to maturity	115-120
Distinct morphological feature	Leaflets dark green, large; kernels cylindrical with rose testa
Special feature	Suitable for <i>kharif</i> rainfed condition



45. Tirupati-3 (TCG-1518)

Year of release	1993
Notification number	S.O. 615(E) dated 17.08.1993
Developed by	APAU, Tirupati
Pedigree	Selection form 'TMV-10'
Breeding method	Pure line selection
Area of adoption	Andhra Pradesh; recommended for endemic areas of kalahasthi malady
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,200 (<i>kharif</i>); 3,500 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,672 (<i>kharif</i>); 2,660 (<i>rabi</i> -summer)
Oil content (%)	53.0
Days to maturity	110-115
Distinct morphological feature	Leaflets dark green; kernels cylindrical with dark red testa
Special feature	Resistant to 'kalahasthi' malady; possesses fresh seed dormancy



46. JCG-88 (Jagtial-88)



Year of release	1993
Notification number	S.O. 401(E) dated 15.05.1998
Developed by	APAU, Jagtial
Pedigree	J-11 x TG (E)-1
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,396
Kernel yield (kg/ha)	1,033
Oil content (%)	48.0
Days to maturity	105-110
Distinct morphological feature	Leaflets light green, medium, oblong; pod constriction and reticulation moderate; rose testa
Special feature	Tolerant of <i>Aspergillus flavus</i> , <i>Aspergillus niger</i> and PBND

47. GG-3 (Gujarat Groundnut-3)

Year of release	1994
Notification number	S.O. 408(E) dated 04.05.1995
Developed by	GAU, Junagadh
Pedigree	GAUG-1 x JL-24
Breeding method	Pedigree method
Area of adoption	Madhya Pradesh and northern Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,283
Kernel yield (kg/ha)	881
Oil content (%)	51.0
Days to maturity	102
Distinct morphological feature	Leaflets medium, oblong light green; foliage remain green till harvest
Special feature	Early maturity



48. Mankya (DRG-12)

Year of release	1994
Notification number	S.O. 408(E) dated 04.05.1995
Developed by	DOR, Hyderabad
Pedigree	R-33-1 - MP-1 x TAP-5
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,604
Kernel yield (kg/ha)	1,797
Oil content (%)	47.0
Days to maturity	115
Distinct morphological feature	Leaflets medium, oblong, light green
Special feature	High yielding, tolerant of rust, LLS and PBNB



49. ALR-2 (ALG - 56)



Year of release	1994
Notification number	S.O. 360(E) dated 01.05.1997
Developed by	TNAU, Aliyarnagar
Pedigree	Selection from 'ICGV-86011' {(Dh-3-20 x USA-20) x NCAC-2232}
Breeding method	Pure line selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,740 (<i>kharif</i>)
Kernel yield (kg/ha)	1,183 (<i>kharif</i>)
Oil content (%)	53.0
Days to maturity	105
Distinct morphological feature	Foliage remain green till harvest
Special feature	Tolerant of LLS and rust

50. BSR-1 (ICGV-86143)

Year of release	1994
Notification number	S.O. 360(E) dated 01.05.1997
Developed by	TNAU, Bhavanisagar
Pedigree	ICGV-44 x (Robut- 33-1 x NCAC-2821)
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,845 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,935 (<i>rabi</i> -summer)
Oil content (%)	50.0
Days to maturity	110
Distinct morphological feature	Leaflets small, elliptic, dark green; rose testa
Special feature	Tolerant of LLS, rust and PBNB



51. TKG-19A (TG-19A)

Year of release	1995
Notification number	S.O. 1(E) dated 01.01.1996
Developed by	B.S.K.K.V., Dapoli
Pedigree	TG-17 x TG-1
Breeding method	Pedigree method
Area of adoption	Konkan region of Maharashtra
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,260
Kernel yield (kg/ha)	1,424
Oil content (%)	46.0
Days to maturity	107
Distinct morphological feature	Green foliage, pods large, reticulated; large seeds
Special feature	Bold and attractive kernels (HPS grade); tolerant of <i>Aspergillus flavus</i> seed colonisation



52. Vemana (K-134)

Year of release	1995
Notification number	S.O.1(E) dated 01.01.1996
Developed by	APAU, Kadiri
Pedigree	Kadiri-3 x JL-24
Breeding method	Modified bulk method
Area of adoption	Andhra Pradesh and Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,677 (<i>kharif</i>); 2,338 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,191 (<i>kharif</i>); 1,613 (<i>rabi</i> -summer)
Oil content (%)	46.0
Days to maturity	106
Distinct morphological feature	Leaflets dark green, medium, elongated
Special feature	Tolerant of leaf spots, PBNB and drought

53. Kadiri- 4 (K-150)

Year of release	1995
Notification number	S.O. 662(E) dated 17.09.1997
Developed by	APAU, Kadiri
Pedigree	Dh-3-30 x NCAC-2230
Breeding method	Modified bulk method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,259
Kernel yield (kg/ha)	1,672
Oil content (%)	48.0
Days to maturity	110-115
Distinct morphological feature	Leaflets small, light green, round
Special feature	Tolerant of LLS and PBNB



54. Smruti (OG-52-1)

Year of release	1995
Notification number	S.O. 1(E) dated 01.01.1996
Developed by	OUA&T, Chiplima
Pedigree	Pollachi-1 x RS-60
Breeding method	Pedigree method
Area of adoption	Orissa
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,982 (<i>kharif</i>); 3,620 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,387 (<i>kharif</i>); 2,534 (<i>rabi</i> -summer)
Oil content (%)	48.0
Days to maturity	110
Distinct morphological feature	Leaflets light green, medium, oblong; red testa
Special feature	Suitable for rain-fed, irrigated and residual moisture situations; resistant to collar rot, stem rot, rust and leaf spots



55. TG-26



Year of release	1995
Notification number	S.O. 1(E) dated 01.01.1996
Developed by	BARC, Trombay
Pedigree	BARC-1 (an induced mutant of JL 24) x TG-23
Breeding method	Pedigree method
Area of adoption	Gujarat, northern Maharashtra and Madhya Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,596 (<i>kharif</i>); 2,425 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,037 (<i>kharif</i>); 1,576 (<i>rabi</i> -summer)
Oil content (%)	49.0
Days to maturity	105
Distinct morphological feature	Compact plant type; smooth pods
Special feature	Possesses fresh seed dormancy; tolerant of rust, LLS and PBND

56. Tirupati-4 (TCGS-30)

Year of release	1995
Notification number	S.O. 92(E) dated 02.02.2001
Developed by	APAU, Tirupati
Pedigree	JL-24 x Ah.-316/S
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,612 (<i>kharif</i>); 2,490 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,389 (<i>kharif</i>); 1,868 (<i>rabi</i> -summer)
Oil content (%)	48.8
Days to maturity	100 -105
Distinct morphological feature	Leaflets large, dark green, oblong
Special feature	Early maturity



57. VRI-4

Year of release	1996
Notification number	S.O. 662(E) dated 17.09.1997
Developed by	TNAU, Vriddhachalam
Pedigree	VG-5 x NCAC-17090
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,660 (<i>kharif</i>); 2,170 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,160 (<i>kharif</i>); 1,562 (<i>rabi</i> -summer)
Oil content (%)	47.0
Days to maturity	110
Distinct morphological feature	Leaflets small, dark green
Special feature	Possesses high sugar content (%)



58. GG-5 (Gujarat Groundnut-5)



Year of release	1997
Notification number	S.O. 425(E) dated 08.06.1999
Developed by	GAU, Junagadh
Pedigree	27-5-1 x JL-24
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,270
Kernel yield (kg/ha)	936
Oil content (%)	49.0
Days to maturity	110
Distinct morphological feature	Leaflets medium, light green
Special feature	Drought tolerant; leaflets stay green at maturity

59. Jawahar groundnut-3 (JGN-3)

Year of release	1997
Notification number	S.O. 425(E) dated 08.06.1999
Developed by	JNKVV, Khargone
Pedigree	Jyoti x JL-24
Breeding method	Pedigree method
Area of adoption	Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,526
Kernel yield (kg/ha)	1,099
Oil content (%)	49.6
Days to maturity	104
Distinct morphological feature	Leaflets medium, green; pods moderately reticulated and constricted; kernels oval shaped; rose testa
Special feature	Tolerant of drought, sucking pests and leaf spots (ELS, LLS)

60. R-9251

Year of release	1997
Notification number	S.O. 401(E) dated 15.05.1998
Developed by	UAS, Raichur
Pedigree	JLM-1 x TG-23
Breeding method	Pedigree method
Area of adoption	Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,346
Kernel yield (kg/ha)	1,420
Oil content (%)	49.0
Days to maturity	90-105
Distinct morphological feature	Semi-dwarf plants; smooth pods
Special feature	Early maturity; tolerant of PBND



61. Apoorva (R-8808)

Year of release	1997
Notification number	S.O. 662(E) dated 17.09.1997
Developed by	UAS, Raichur
Pedigree	ICGS-11 x Chico
Breeding method	Pedigree method
Area of adoption	Karnataka, Andhra Pradesh and Tamil Nadu
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,426
Kernel yield (kg/ha)	1,674
Oil content (%)	48.5
Days to maturity	110
Distinct morphological feature	Leaflets medium, oblong, dark green
Special feature	Tolerant of LLS and PBND

62. Phule Vyas (JL-220)

Year of release	1998
Notification number	S.O. 821(E) dated 13.09.2000
Developed by	MPKV, Jalgaon
Pedigree	JL-80 x VG-77
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,360
Oil content (%)	52.0
Days to maturity	90-95
Distinct morphological feature	Leaflets dark green big, obovate; testa brick red
Special feature	High oil content; early maturity



63. ALR-3 (ALG-63)

Year of release	1999
Notification number	S.O.821(E) dated 13.09.2000
Developed by	TNAU, Aliyarnagar
Pedigree	{(R-33-1 x ICG (FDRS) 68} x (NCAC-17090 x ALR-1)
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,939
Kernel yield (kg/ha)	1,338
Oil content (%)	50.0
Days to maturity	110-115
Distinct morphological feature	Leaflets green, medium sized, elliptic
Special feature	Suitable for early sowing in south-west monsoon; tolerant of LLS and resistant to rust



64. Co-3 (TNAU-256)

Year of release	1999
Notification number	S.O. 821(E) dated 13.09.2000
Developed by	TNAU, Coimbatore
Pedigree	VRI 3 x JL 24
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,750 (<i>kharif</i>); 2,150 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,250 (<i>kharif</i>); 1,335 (<i>rabi</i> -summer)
Oil content (%)	49.2
Days to maturity	110 -115
Distinct morphological feature	Leaflets large, oblong, dark green; kernels bold with tan testa
Special feature	Tolerant of PBND

65. VRI (Gn)-5

Year of release	2001
Notification number	S.O. 1134(E) dated 15.11.2001
Developed by	TNAU, Vriddhachalam
Pedigree	CG 26 x ICGS 44
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,133 (<i>kharif</i>); 2,384 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,578 (<i>kharif</i>); 1,764 (<i>rabi</i> -summer)
Oil content (%)	50.0
Days to maturity	105-110
Distinct morphological feature	Leaflets dark green, medium, oblong; red testa
Special feature	Resistant to rust and LLS



66. Co (Gn)-4 (TNAU-269)

Year of release	2001
Notification number	S.O. 1134(E) dated 15.11.2001
Developed by	TNAU, Coimbatore
Pedigree	TMV-10 x ICGS-82
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,500 (<i>kharif</i>); 1,950 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,095 (<i>Kharif</i>); 1,161 (<i>rabi</i> -summer)
Oil content (%)	53.0
Days to maturity	105-110
Distinct morphological feature	Leaflets dark green, large, oblong; rose testa
Special feature	Resistant to rust and LLS; possesses high oil content



67. GG-7 (J-38)

Year of release	2001
Notification number	S.O. 1134(E) dated 15.11.2001
Developed by	GAU, Junagadh
Pedigree	S-206 x FESR-8 1-1-9-B-B
Breeding method	Pedigree method
Area of adoption	Gujarat and southern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,149
Kernel yield (kg/ha)	1,633
Oil content (%)	49.0
Days to maturity	100
Distinct morphological feature	Leaflets dark green, medium, elliptical; pink testa
Special feature	Early maturity; tolerant of LLS

68. AK-159

Year of release	2002
Notification number	S.O. 937(E) dated 04.09.2002
Developed by	PKV, Akola
Pedigree	JL-24 x CGC-4018
Breeding method	Pedigree method
Area of adoption	Maharashtra and Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,606
Kernel yield (kg/ha)	1,092
Oil content (%)	51.0
Days to maturity	106
Distinct morphological feature	Leaflets dark green, medium, elliptic; white rose testa
Special feature	Early maturity; possesses high oil content



69. GG-6

Year of release	2003
Notification number	S.O. 283(E) dated 12.03.2003
Developed by	GAU, Junagadh
Pedigree	CGC-3 x FESR-5-P6-b1-b1-1-1-1-B-B
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,782
Kernel yield (kg/ha)	2,031
Oil content (%)	50.0
Days to maturity	100
Distinct morphological feature	Leaflets yellowish green, large, oblong, elliptic; rose testa
Special feature	Early maturity; high shelling (73%)



70. TPG-41



Year of release	2004
Notification number	S.O. 161(E) dated 04.02.2004
Developed by	BARC, Trombay
Pedigree	TG-28 A x TG-22
Breeding method	Pedigree method
Area of adoption	All India
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,088
Kernel yield (kg/ha)	1,441
Oil content (%)	49.0
Days to maturity	122
Distinct morphological feature	Leaflets green, medium; pods 2 seeded; pink testa
Special feature	Large seeds (>60 g/100 kernel); high O/L ratio (3.27), tolerant of rust; possesses fresh seed dormancy (up to 25 days)

71. TG-37A

Year of release	2004
Notification number	S.O. 161(E) dated 04.02.2004
Developed by	BARC, Trombay
Pedigree	TG-25 x TG-26
Breeding method	Pedigree method
Area of adoption	Rajasthan, Uttar Pradesh, Punjab, Gujarat (Zone-I); Gujarat (Zone-II); Orissa, West Bangal, Bihar and NEH states (Zone-IV)
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,084 (<i>kharif</i>); 2,835 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,382 (<i>kharif</i>); 1,903 (<i>rabi</i> -summer)
Oil content (%)	48.0
Days to maturity	122
Distinct morphological feature	Leaflets green, medium; pods 3 seeded; rose testa
Special feature	Possesses fresh seed dormancy (up to 15 days); tolerant of collar rot, rust and LLS



72. Vikas (GPBD-4)

Year of release	2004
Notification number	S.O. 642(E) dated 31.05.2004
Developed by	UAS, Dharwad
Pedigree	KRG-1 x ICGV-86855
Breeding method	Pedigree method
Area of adoption	Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu (Zone-V); Jharkhand, WB, Orissa, and Assam (Zone-IV)
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,496
Oil content (%)	49.0
Days to maturity	107
Distinct morphological feature	Leaflets dark green, medium, wide elliptic; pods 2-1 seeded; tan testa
Special feature	Resistant to LLS and rust



73. Prutha (Dh-86)



Year of release	2005
Notification number	S.O. 122(E) dated 02.02. 2005
Developed by	UAS, Dharwad
Pedigree	Dh-40 x Dh-8
Breeding method	Pedigree method
Area of adoption	Gujarat, southern Rajasthan, Maharashtra, Orissa and West Bengal
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	4,022 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	2,735 (<i>rabi</i> -summer)
Oil content (%)	48.0
Days to maturity	125-127
Distinct morphological feature	Leaflets dark green; tan testa
Special feature	Semi-dwarf; high harvest index (HI); tolerant of LLS and sucking pests

74. Kadiri-5

Year of release	2005
Notification number	S.O. 122(E) dated 02.02.2005
Developed by	ANGRAU, Kadiri
Pedigree	JL-24 x VG-55-7
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,540
Oil content (%)	48.0
Days to maturity	100-110
Distinct morphological feature	Leaflets light green, broad; pods 1-2-3 seeded; rose testa
Special feature	Tolerant of drought and leaf spots



75. Kadiri-6 (K-1240)

Year of release	2005
Notification number	S.O. 122(E) dated 02.02.2005
Developed by	ANGRAU, Kadiri
Pedigree	JL-24 x Ah-316/S
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	3,100-3,800
Kernel yield (kg/ha)	2,100-3,500
Oil content (%)	49.0
Days to maturity	100-105
Distinct morphological feature	Leaflets light green, broad; pods 2 seeded; tan testa
Special feature	Tolerant of leaf spots



76. Pratap Munghali-2 (ICUG-92195)

Year of release	2005
Notification number	S.O. 1566(E) dated 05.11.2005
Developed by	MPUA&T, Udaipur
Pedigree	ICGV-86055 x ICG (FDRS-10)
Breeding method	Bulk pedigree method
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,800-2,800
Kernel yield (kg/ha)	1,242-1,932
Oil content (%)	48.0-50.0
Days to maturity	105
Distinct morphological feature	Leaflets medium green; pink testa
Special feature	Tolerant of ELS, LLS and PBNB and tolerant of <i>Spodoptera litura</i> , leaf miner and thrips



77. Pratap Munghali-1 (ICUG-92035)

Year of release	2005
Notification number	S.O.1566(E) dated 05.11.2005
Developed by	MPUA&T, Udaipur
Pedigree	ICGV-86033 x ICG-2214
Breeding method	Bulk pedigree method
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,500-3,000
Kernel yield (kg/ha)	1,550-1,860
Oil content (%)	48.0-50.0
Days to maturity	108
Distinct morphological feature	Leaflets medium green; kernels with rose testa
Special feature	Tolerant of ELS, LLS and PBNB and resistant to <i>Spodoptera litura</i> , leaf miner and thrips



78. GG-8 (J-53)

Year of release	2006
Notification number	S.O. 1572(E) dated 20.09.2006
Developed by	JAU, Junagadh
Pedigree	(27-5-1 x JL-24) 30-3-2-B-B
Breeding method	Pedigree method
Area of adoption	Northern Maharashtra and Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,716
Kernel yield (kg/ha)	1,184
Oil content (%)	46.0
Days to maturity	104-107
Distinct morphological feature	Leaflets medium, green; pods 2 seeded without constriction; rose testa
Special feature	Tolerant of PBND, collar and stem rot diseases



79. TG-38B (TG-38)



Year of release	2006
Notification number	S.O. 1572(E) dated 20.09.2006
Developed by	BARC, Trombay
Pedigree	Gamma ray induced mutant from F1 seeds of the cross Girnar 1 x TG-26
Breeding method	Mutation breeding and pedigree method
Area of adoption	Orissa, West Bengal, Bihar and North Eastern states
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,768
Kernel yield (kg/ha)	1,965
Oil content (%)	48.0
Days to maturity	115-125
Distinct morphological feature	Leaflets medium green; pod constriction medium; kernels, spheroidal with pink testa
Special feature	Tolerant of stem rot

80. Vasundhara (Dh-101)

Year of release	2007
Notification number	S.O. 122(E) dated 06.02.2007
Developed by	UAS, Dharwad
Pedigree	R-9241 x Dh-51-2
Breeding method	Pedigree method
Area of adoption	West Bengal, Orissa, Jharkhand and Assam
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,877
Kernel yield (kg/ha)	1,928
Oil content (%)	50.0
Days to maturity	120-130
Distinct morphological feature	Leaflets light green, small
Special feature	Tolerant of stem rot, PBND, thrips and <i>Spodoptera litura</i>



81. Ratneshwar (LGN-1)

Year of release	2005
Notification number	S.O. 122(E) dated 06.02.2007
Developed by	MAU, Latur
Pedigree	JL-24 x NCAC-17090
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,487
Kernel yield (kg/ha)	1,026
Oil content (%)	51.2
Days to maturity	105
Distinct morphological feature	Leaflets medium green, medium; pods 1-2 seeded; kernels with rose testa
Special feature	Tolerant of LLS, stem rot, rust and PBND

82. TLG-45



Year of release	2007
Notification number	S.O. 122(E) dated 06.02.2007
Developed by	MAU, Latur
Pedigree	TG-19 x TAG-24
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,506
Kernel yield (kg/ha)	994
Oil content (%)	51.0
Days to maturity	114
Distinct morphological feature	Leaflets green, oblong-elliptic; pod constriction and reticulation medium; kernels with monochrome rose testa
Special feature	Large seeded

83. SG-99

Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	PAU, Ludhiana
Pedigree	ICGV-86829 x ICGV-87160 {ICG (FDRS)-10}
Breeding method	Bulk pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,193 (<i>kharif</i>); 2,501 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,425 (<i>kharif</i>); 1,626 (<i>rabi</i> -summer)
Oil content (%)	50.0-52.3
Days to maturity	102
Distinct morphological feature	Leaflets green, medium, elliptical; pods 1-2 seeded; kernels with rose testa
Special feature	Tolerant of PBND



84. Prasuna (TCGS-341)

Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	ANGRAU, Tirupati
Pedigree	TCG-1717 x TCG-1518
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,500 (<i>kharif</i>); 4,500 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,900 (<i>kharif</i>), 3,220 (<i>rabi</i> -summer)
Oil content (%)	50.0
Days to maturity	110
Distinct morphological feature	Leaflets dark green, medium, elliptical; pod constrict on and reticulation slight; kernels with rose testa
Special feature	Tolerant of 'Kalahasti' malady



85. ICGV-91114

Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	ICRISAT, Hyderabad
Pedigree	(ICGV-86055 x ICGV-86533) F2-P8-B1-B1-B1-B1
Breeding method	Bulk pedigree method
Area of adoption	Andhra Pradesh and Orissa
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,500
Oil content (%)	48.0
Days to maturity	90-95
Distinct morphological feature	Leaflets light green, small to medium, elliptical; pod constriction and reticulation slight; kernels with light tan testa
Special feature	Early maturity; tolerant of rust and LLS and drought

86. Phule Unap (JL-286)



Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	MPKV, Jalgaon
Pedigree	JL-86 x NCAC-343
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,231 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,673 (<i>rabi</i> -summer)
Oil content (%)	49.0-50.0
Days to maturity	93-95
Distinct morphological feature	Leaflets green, medium, elongate elliptic; pods 2-3 seeded; kernels with brick red testa
Special feature	Early maturity; tolerant of LLS, rust and stem rot, thrips, leaf miner and <i>Spodoptera litura</i>

87. Abhaya (TPT-25)

Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	ANGRAU, Tirupati
Pedigree	K-134 x TAG-24
Breeding method	Single seed descent method with trait based selection
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,300 (<i>kharif</i>); 3,756 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,748 (<i>kharif</i>); 2,855 (<i>rabi</i> -summer)
Oil content (%)	52.3
Days to maturity	106
Distinct morphological feature	Leaflets dark green, narrow, elliptical; pod reticulation shallow; kernels with rose testa
Special feature	Tolerant of early and mid-season moisture stress conditions; tolerant of LLS, sucking insects (jassids and thrips) and <i>Spodoptera litura</i>



88. TMV (Gn)-13



Year of release	2007
Notification number	S.O. 1178(E) dated 20.07. 2007
Developed by	TNAU, Coimbatore
Pedigree	Selection from Pollachi red local
Breeding method	Selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,580
Kernel yield (kg/ha)	1,935
Oil content (%)	50.0
Days to maturity	105-110
Distinct morphological feature	Leaflets dark green, medium, elliptic oblong; kernels with red testa
Special feature	Tolerant of early and mid-season moisture stress conditions, tolerant of LLS, rust and PBNB

89. Kalahasti (TCGS-320)

Year of release	2007
Notification number	S.O. 1703(E) dated 05.12. 2007
Developed by	ANGRAU, Tirupati
Pedigree	TCG-1709 x TCG-1518
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,377 (<i>kharif</i>); 3,764 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	943 (<i>kharif</i>); 2,823 (<i>rabi</i> -summer)
Oil content (%)	52.3
Days to maturity	110
Distinct morphological feature	Leaflets dark green, short, oval; pod constriction shallow; kernels with red testa
Special feature	Suitable for <i>rabi</i> situation for kalahasti malady endemic areas and also for <i>kharif</i> in North coastal and north Telangana of Andhra Pradesh; tolerant of PBNB; resistant to jassids



90. Narayani (TCGS-29)

Year of release	2007
Notification number	S.O. 1703(E) dated 05.12.2007
Developed by	ANGRAU, Tirupati
Pedigree	JL-24 x Ah-316/S
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,250 (<i>kharif</i>); 3,764 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,642 (<i>kharif</i>); 2,861 (<i>rabi</i> -summer)
Oil content (%)	47.5
Days to maturity	100
Distinct morphological feature	Leaflets green, large, elliptic; pod constriction and reticulation moderate; light red testa
Special feature	Tolerant of mid-season moisture stress conditions



91. VL-Moongphali-1

Year of release	2008
Notification number	S.O. 211(E) dated 29.01.2010
Developed by	VPKAS, Almora
Pedigree	Selection from ICGV-86590 (X 14-4-B-19-8 x PI 239747)
Breeding method	Pureline selection
Area of adoption	Uttarakhand
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,943
Kernel yield (kg/ha)	-
Oil content (%)	-
Days to maturity	125-130
Distinct morphological feature	Leaflets light green; pod 3-4 seeded; rose testa
Special feature	Resistant to LLS and root rot diseases



92. TG-51

Year of release	2008
Notification number	S.O. 2458(E) dated 16.10.2008
Developed by	BARC, Trombay
Pedigree	TG-26 x Chico
Breeding method	Pedigree method
Area of adoption	West Bengal, Orissa, Jharkhand and Assam
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,675
Kernel yield (kg/ha)	1,819
Oil content (%)	49.0
Days to maturity	124
Distinct morphological feature	Leaflets green, medium in size; rose testa
Special feature	Tolerant of stem rot and root rot diseases

93. Ajeya (R-2001-3)

Year of release	2008
Notification number	S.O. 2458(E) dated 16.10.2008
Developed by	UAS, Raichur
Pedigree	ICGS-11 x ICG-4728
Breeding method	Bulk pedigree method
Area of adoption	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,440
Kernel yield (kg/ha)	1,659
Oil content (%)	46.0-48.0
Days to maturity	105-120
Distinct morphological feature	Leaflets green, medium, oblong elliptic; pod reticulation slight with 4-5 prominent ribs; salmon testa
Special feature	Resistant to PBNB; drought tolerant; wider adaptability



94. VRI (Gn)-6

Year of release	2009
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	TNAU, Vriddhachalam
Pedigree	ALR-2 x VG-9513
Breeding method	Pedigree method
Area of adoption	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,259
Kernel yield (kg/ha)	1,491
Oil content (%)	47.0
Days to maturity	100-106
Distinct morphological feature	Leaflets light green, medium, obovate; light rose testa
Special feature	Tolerant of LLS, rust and PBNB

95. Jawahar Groundnut-23 (JGN-23)

Year of release	2009
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	JNKVV, Khargone
Pedigree	JL-24 x ICG-7886
Breeding method	Bulk pedigree method
Area of adoption	Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,631
Kernel yield (kg/ha)	1,142
Oil content (%)	49.0
Days to maturity	104
Distinct morphological feature	Pod prominently reticulated; tan testa
Special feature	Tolerant of ELS, LLS and drought

96. Kadiri-9

Year of release	2009
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	ANGRAU, Kadiri
Pedigree	Kadiri-4 x Vemana
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,500-3,000
Kernel yield (kg/ha)	1,750-2,100
Oil content (%)	50.0
Days to maturity	105-110
Distinct morphological feature	Leaflets green, obtuse; rose testa
Special feature	Tolerant of early and end-of-season drought



97. Greeshma



Year of release	2009
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	ANGRAU, Tirupati
Pedigree	TIR-46 x JUG-37
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,000-2,500 (<i>kharif</i>); 4,000-4,700 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	1,500-1,875 (<i>kharif</i>); 3,000-3,525 (<i>rabi</i> -summer)
Oil content (%)a	48.0-50.0
Days to maturity	95-100
Distinct morphological feature	Leaflets dark green, oval; pod with shallow constriction; rose with flesh tinge testa
Special feature	Early maturity; tolerant of drought, high temperature and aflatoxin contamination

98. Vijetha (R-2001-2)

Year of release	2010
Notification number	S.O. 211(E) dated 29.01.2010
Developed by	UAS, Raichur
Pedigree	ICGS-11 x ICG-4728
Breeding method	Pedigree method
Area of adoption	West Bengal, Orissa, Jharkhand, Assam (Zone-IV); southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu (Zone-V)
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	1,600 (<i>kharif</i>)
Kernel yield (kg/ha)	1,088 (<i>kharif</i>)
Oil content (%)	46.0-48.0
Days to maturity	105-120
Distinct morphological feature	Leaflets medium, narrow elliptic, green; pod constriction absent; reticulation slight with 4-5 prominent ribs; salmon testa
Special feature	Resistant to PBNB



99. Girnar-3 (PBS-12160)

Year of release	2010
Notification number	S.O. 733(E) dated 01.04.2010
Developed by	DGR, Junagadh
Pedigree	Girnar-1 x ICGS-11
Breeding method	Bulk pedigree method
Area of adoption	West Bengal, Orissa, Manipur
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,520
Kernel yield (kg/ha)	1,064
Oil content (%)	45.0
Days to maturity	104-111
Distinct morphological feature	Leaflets small, elliptic, green; pod reticulation slight; rose testa
Special feature	Tolerant of leaf miner and thrips



100. Kadiri Haritandhra (K-1319)



Year of release	2010
Notification number	S.O. 733(E) dated 01.04.2010
Developed by	ANGRAU, Kadiri
Pedigree	91/57-2 x PI-476177
Breeding method	Modified pedigree method
Area of adoption	Karnataka and Maharashtra
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	3,728
Kernel yield (kg/ha)	2,535
Oil content (%)	48.0
Days to maturity	122
Distinct morphological feature	Leaflets medium, lanceolate, dark green; pod constriction absent, reticulation slight; rose testa
Special feature	Possesses fresh seed dormancy (upto 20 days); multiple diseases (rust, ELS, LLS, stem rot, PBNB) and insect pests (thrips, <i>Spodoptera litura</i> , jassid, <i>Helicoverpa</i>) resistant

101. GPBD-5

Year of release	2010
Notification number	S.O. 2137(E) dated 31.08.2010
Developed by	UAS, Dharwad
Pedigree	TG-49 x GPBD-4
Breeding method	Pedigree method
Area of adoption	Jharkhand and Manipur
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,470
Kernel yield (kg/ha)	997
Oil content (%)	46.0
Days to maturity	105-110
Distinct morphological feature	Leaflets medium, oblong, light green; pod medium, constriction and reticulation moderate; tan testa
Special feature	Tolerant of LLS and rust



102. JL-501

Year of release	2010
Notification number	S.O. 211(E) dated 29.01.2010
Developed by	MPKV, Jalgaon
Pedigree	Selection from TAG-24
Breeding method	Pureline selection
Area of adoption	Gujarat and southern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,661
Kernel yield (kg/ha)	1,105
Oil content (%)	48.0
Days to maturity	102
Distinct morphological feature	Leaflets medium, oblong elliptic, green; pod medium, sized, clustered at base, constriction and reticulation slight; light tan testa
Special feature	Early maturity



103. RARS-T-1

Year of release	2011
Notification number	S.O. 283(E) dated 07.02.2011
Developed by	ANGRAU, Tirupati
Pedigree	TAG-24 × TG-19
Breeding method	Modified pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	2,500(<i>kharif</i>); 4,000 (<i>rabi</i>)
Kernel yield (kg/ha)	1,575 (<i>kharif</i>); 2,547 (<i>rabi</i>)
Oil content (%)	44.0
Days to maturity	115
Distinct morphological feature	Short stature, leaflets dark, narrow; pod 2-3 seeded
Special feature	Bold seeded pods

104. RARS-T-2

Year of release	2011
Notification number	S.O. 283(E) dated 07.02.2011
Developed by	ANGRAU, Tirupati
Pedigree	Tirupati-4 × TIR-45
Breeding method	Pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	3,734 (<i>kharif</i>); 4,200 (<i>rabi</i>)
Kernel yield (kg/ha)	2,600(<i>kharif</i>); 3,024 (<i>rabi</i>)
Oil content (%)	48.0
Days to maturity	90-95
Distinct morphological feature	Semi-dwarf plant; pods medium; reticulation moderate
Special feature	Early maturity

105. Pratap Raj Mungphali

Year of release	2011
Notification number	S.O. 283(E) dated 07.02.2011
Developed by	MPAU&T, Udaipur
Pedigree	Selection from ICGV-98223
Breeding method	Bulk pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif and summer</i>
Pod yield (kg/ha)	1,432 (<i>kharif</i>); 2,280 (summer)
Kernel yield (kg/ha)	974 (<i>kharif</i>); 1,528 (summer)
Oil content (%)	48.0
Days to maturity	97
Distinct morphological feature	Leaflets medium, medium green; constriction and reticulation moderate; rose testa
Special feature	Early maturity; tolerant of ELS, LLS, PBND, jassids, thrips, leaf miner and <i>Spodoptera litura</i>

106. ICGV-00350

Year of release	2012
Notification number	S.O. 456(E) dated 16.03.2012
Developed by	ANGRAU, Tirupati
Pedigree	ICGV-87290 × ICGV-87846
Breeding method	Bulk pedigree method
Area of adoption	Tamil Nadu and Andhra Pradesh
Recommended production system	<i>Rabi</i> -summer
Pod yield (kg/ha)	2,988
Kernel yield (kg/ha)	1,942
Oil content (%)	50.0
Days to maturity	114
Distinct morphological feature	Leaflets oblong-elliptic; constriction and reticulation moderate; rose testa
Special feature	Resistant to LLS and rust; tolerant of stem rot

107. GJG-31 (J 71)

Year of release	2012
Notification number	S.O. 1708(E) dated 26.07.2012
Developed by	JAU, Junagadh
Pedigree	GG 5 × ICGV-90116; K-98-33-B-20-1-B-B
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,631
Kernel yield (kg/ha)	1,174
Oil content (%)	48.0
Days to maturity	103
Distinct morphological feature	Leaflets medium, Lanceolate light green; constriction shallow and reticulation absent; rose testa
Special feature	Tolerant of stem rot



108. GJG-9 (J-69)

Year of release	2012
Notification number	S.O. 1708(E) dated 26.07.2012
Developed by	JAU, Junagadh
Pedigree	GG-2 × PBS-21065; K-98-34-B-3-1-B-B
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	Summer
Pod yield (kg/ha)	3,483
Kernel yield (kg/ha)	2,473
Oil content (%)	49.0
Days to maturity	117
Distinct morphological feature	Leaflets medium, Lanceolate light green; constriction and reticulation medium; rose testa
Special feature	-



B. Habit Group: Valencia

1. Kopergaon-3

Year of release	1933
Notification number	Released by Govt. of Ex Bombay state
Developed by	MPKV, Kopergaon
Pedigree	Selection from local
Area of adoption	Western Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,900
Kernel yield (kg/ha)	1,311
Oil content (%)	47.0
Days to maturity	90-100
Distinct morphological feature	Leaves oblong, large, light green; pods 3-seeded; red testa
Special feature	Early maturity; suitable for table purpose



2. Gangapuri



Year of release	1971
Notification number	Released by Madhya Pradesh state
Developed by	JNKVV, Khargone
Pedigree	Selection from a 'local strain'
Area of adoption	Madhya Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,194
Oil content (%)	49.5
Days to maturity	95-105
Distinct morphological feature	Leaves large, oblong, light green; pods constricted, 3-4-seeded; purple testa
Special feature	Early maturity; suitable for table purpose

3. TMV-11

Year of release	1977
Notification number	Released by Tamil Nadu state
Developed by	TNAU, Tindivanam
Pedigree	Selection from a East African variety
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,200
Kernel yield (kg/ha)	876
Oil content (%)	50.2
Days to maturity	105
Distinct morphological feature	Leaves large, oblong, light green; pods 3-1-seeded with purple testa
Special feature	Tolerant of rust and LLS



4. MH-2

Year of release	1978
Notification number	S.O. 13 dated 19.12.1978
Developed by	HAU, Hissar
Pedigree	Selection from Gujarat dwarf mutant (GDM)
Area of adoption	Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	3,000
Kernel yield (kg/ha)	2,160
Oil content (%)	49.0
Days to maturity	105-110
Distinct morphological feature	Dwarf; pod 4-1-seeded with red testa
Special feature	Responsive to closer spacing (15 x 15 cm)



5. MH-4



Year of release	1989
Notification number	S.O. 386(E) dated 15.05.1990
Developed by	HAU, Hissar
Pedigree	Selection from MH-2
Area of adoption	Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,222
Oil content (%)	48.5
Days to maturity	105
Distinct morphological feature	Dwarf; leaves green; pod thick shelled, 3-1-seeded; Red testa
Special feature	Tolerant of LLS

C. Habit group: Virginia Bunch

1. Kopergaon-1

Year of release	1933
Notification number	S.O. 19(E) dated 14.01.1982 denotified S.O. 429(E) dated 03.06.1994
Developed by	MPKV, Kopergaon
Pedigree	Selection from a 'local cultivar'
Breeding method	Mass selection
Area of adoption	Sangli and Kolhapur districts of Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,250
Kernel yield (kg/ha)	900
Oil content (%)	47.0
Days to maturity	120
Distinct morphological feature	Leaflets dark green, small, oblong; pod occasionally 3-seeded, moderately constricted and reticulated; kernels medium in size with tan testa
Special feature	Suitable for medium to heavy soils

2. RSB-87



Year of release	1961
Notification number	S.O. 19(E) dated 14.01.1982
Developed by	RAU, Durgapura
Pedigree	Selection from 'Brazilian collection'
Breeding method	Mass selection
Area of adoption	Kota region and other heavy soil areas of Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,750
Kernel yield (kg/ha)	1,155
Oil content (%)	50.0
Days to maturity	120 -130
Distinct morphological feature	Leaflets dark green, small, oblong; pod medium in size; kernels bold, fusiform with red testa
Special feature	Resistant to ELS and rust

3. TMV-6

Year of release	1961
Notification number	Released by Tamil Nadu state
Developed by	TNAU, Tindivanam
Pedigree	Selection from 'Virginia Bunch'
Breeding method	Mass selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	950
Kernel yield (kg/ha)	694
Oil content (%)	48.0
Days to maturity	140
Distinct morphological feature	Leaflets dark green, small, lanceolate; pod constriction shallow, reticulation prominent; kernels with red testa
Special feature	Suitable for table purpose; tolerant of rust and LLS

4. c-501

Year of release	1961
Notification number	Released by Punjab state
Developed by	PAU, Ludhiana
Pedigree	D-3 x Ah-477
Breeding method	Pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,750
Kernel yield (kg/ha)	1,190
Oil content (%)	48.0
Days to maturity	130
Distinct morphological feature	Leaflets dark green, small, lanceolate; pod constriction and reticulation slight; red testa
Special feature	Suitable for sandy loam soils under irrigation; tolerant of LLS and collar rot

5. T-64 (Type-64)



Year of release	1966
Notification number	S.O. 13 dated 19.12.1978
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from a Chinese germplasm 'Ta-Lin-Chin' (EC
Breeding method	Mass selection
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,470
Oil content (%)	48.0
Days to maturity	115 -120
Distinct morphological feature	Leaflets green, large, oblong; pod constriction medium, reticulation prominent; kernels elliptical with light red testa
Special feature	Tolerant of rust and LLS

6. TMV-8

Year of release	1968
Notification number	Released by Tamil Nadu state
Developed by	TNAU, Tindivanam
Pedigree	Selection from 'Manaparai local'
Breeding method	Mass selection
Area of adoption	Southern and central region of Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,600
Kernel yield (kg/ha)	1,190
Oil content (%)	50.1
Days to maturity	120
Distinct morphological feature	Leaflets green, small, lanceolate; pod mostly 3-seeded, constriction and reticulation slight; red testa
Special feature	Possesses fresh seed dormancy (up to 60 days)

7. M-145

Year of release	1968
Notification number	S.O. 361(E) dated 30.06.1973
Developed by	PAU, Ludhiana
Pedigree	A-1-1 x D-3
Breeding method	Mass selection
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,672
Oil content (%)	50.5
Days to maturity	125
Distinct morphological feature	Leaflets green, small, oblong; pod constriction moderate, reticulation slight; purple testa
Special feature	Tolerant of rust and LLS



8. TMV-10



Year of release	1970
Notification number	S.O. 786 dated 02.02.1976
Developed by	TNAU, Tindivanam
Pedigree	Natural mutant from an 'Argentine type'
Breeding method	Natural mutation
Area of adoption	Tamil Nadu and recommended for entire country
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,700
Kernel yield (kg/ha)	1,321
Oil content (%)	54.4
Days to maturity	120
Distinct morphological feature	Kernels with variegated testa
Special feature	Possesses highest oil content

9. Vikram (TG-1)

Year of release	1973
Notification number	Released by Maharashtra state
Developed by	BARC, Trombay
Pedigree	X-ray mutant from 'Spanish improved'
Breeding method	Induced mutation
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,695
Kernel yield (kg/ha)	1,833
Oil content (%)	46.5
Days to maturity	120
Distinct morphological feature	Leaflets dark green, small, oblong; pod constriction and reticulation slight; kernels with variegated testa
Special feature	Bold pods, kernels HPS grade (72 g/100 kernels)



10. Kadiri-2 (MK-374)

Year of release	1978
Notification number	S.O. 470(E) dated 19.02.1980
Developed by	APAU, Kadiri
Pedigree	Selection from an introduced Nigerian culture 'MK-374'
Breeding method	Introduction
Area of adoption	Srikakulam, Vishakhapatnam and Chittoor districts of Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,800
Kernel yield (kg/ha)	1,404
Oil content (%)	47.0
Days to maturity	115 -120
Distinct morphological feature	Leaflets green, small, oblong; pod constriction and reticulation moderate; brown testa
Special feature	Bold seeded; efficient in fixing atmospheric nitrogen



11. Kadiri-3



Year of release	1978
Notification number	S.O. 470(E) dated 19.02.1980
Developed by	APAU, Kadiri
Pedigree	Selection from 'Robut-33-1'
Breeding method	Mass selection
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,575
Oil content (%)	49.0
Days to maturity	100 -110
Distinct morphological feature	Leaflets dark green, small, elliptic; pod constriction and reticulation moderate; rose testa
Special feature	Early maturity; tolerant of LLS

12. BG-1 (Birsa Groundnut-1)

Year of release	1979
Notification number	S.O. 499(E) dated 08.07.1983
Developed by	BAU, Kanke
Pedigree	X-ray mutant of '41-C'
Breeding method	Induced mutation
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,518
Oil content (%)	49.3
Days to maturity	120 -125
Distinct morphological feature	Leaflets dark green, small, oblong; pod constriction and reticulation slight; rose testa
Special feature	Bold kernels (50 g/100 kernel)



13. BG-2 (Birsa Groundnut-2)

Year of release	1979
Notification number	S.O. 2(E) dated 03.01.1983
Developed by	BAU, Kanke
Pedigree	X-ray mutant of '41-C'
Breeding method	Induced mutation
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,200
Kernel yield (kg/ha)	1,518
Oil content (%)	49.3
Days to maturity	120 -125
Distinct morphological feature	Leaflets green, large, oblong; pod constriction and reticulation slight; kernels with rose testa
Special feature	Bold kernels (51 g/100 kernels)



14. M-197



Year of release	1982
Notification number	S.O. 832(E) dated 18.11.1985
Developed by	PAU, Ludhiana
Pedigree	c 501 x U-4-7-2
Breeding method	Pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,650
Kernel yield (kg/ha)	1,138
Oil content (%)	49.0
Days to maturity	135
Distinct morphological feature	Leaflets medium, dark, oblong; pod smooth; kernels bold with rose testa
Special feature	Resistant to ELS

15. Kaushal (G-201)

Year of release	1984
Notification number	S.O. 295(E) dated 09.04.1985
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from 'T-28'
Breeding method	Mass selection
Area of adoption	All India
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,700
Kernel yield (kg/ha)	1,207
Oil content (%)	49.0
Days to maturity	108 -112
Distinct morphological feature	Leaflets large, dark, elliptic; pod smooth; variegated testa
Special feature	Early maturity; resistant to ELS



16. BG-3 (Birsa Groundnut-3)

Year of release	1986
Notification number	S.O. 386(E) dated 15.05.1990
Developed by	BAU, Kanke
Pedigree	Early Runner x Asiriya Mwitunde
Breeding method	Mass selection
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,500
Kernel yield (kg/ha)	1,800
Oil content (%)	49.0
Days to maturity	115-125
Distinct morphological feature	Leaflets, small, dark green, oblong; pod smooth; rose testa
Special feature	Early maturity; drought tolerant



17. MA-16



Year of release	1986
Notification number	Released by Uttar Pradesh state
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from 'EC-16664'
Breeding method	Mass selection
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,500
Kernel yield (kg/ha)	1,110
Oil content (%)	46.0
Days to maturity	120-125
Distinct morphological feature	Leaflets, small, dark green; pod moderately constricted and reticulated; kernels large with rose testa
Special feature	Tolerant of ELS and LLS; bold seeded

18. ALR-1 (AFDRS-20)

Year of release	1987
Notification number	S.O 915(E) dated 06.11.1989
Developed by	TNAU, Aliyarnagar
Pedigree	Pollachi-2 x PPG-4
Breeding method	Pedigree method
Area of adoption	Pollachi tract of Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,840
Kernel yield (kg/ha)	1,288
Oil content (%)	49.0
Days to maturity	125
Distinct morphological feature	Leaflets small, dark green, oblong; pod smooth with shallow constriction; kernels small with tan testa
Special feature	Resistant to rust and LLS; suitable for rust endemic areas (Pollachi tract)



19. ICGS-76 (ICGV-87141)

Year of release	1989
Notification number	S.O 915(E) dated 06.11.1989
Developed by	ICRISAT, Hyderabad
Pedigree	TMV-10 x Chico
Breeding method	Bulk pedigree
Area of adoption	Southern Maharashtra and Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,300
Kernel yield (kg/ha)	936
Oil content (%)	42.5
Days to maturity	115 -125
Distinct morphological feature	Leaflets medium, dark green, elliptic; pod smooth with shallow constriction; kernels medium with tan testa
Special feature	Resistant to ELS



20. RS-138



Year of release	1989
Notification number	Released by Rajasthan State
Developed by	RAU, Durgapura
Pedigree	Selection from 'Brazilian culture'
Breeding method	Pureline selection
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,512
Oil content (%)	50.0
Days to maturity	125-130
Distinct morphological feature	Leaflets green, medium, obovate; pod constriction moderate, reticulation slight; kernels spherical with red testa
Special feature	Resistant to ELS and rust

21. Konkan Gaurav

Year of release	1990
Notification number	S.O 615(E) dated 17.08.1993
Developed by	BSKKV, Dapoli
Pedigree	Selection from ICGS-1
Breeding method	Pureline selection
Area of adoption	Konkan region of Maharashtra
Recommended production system	<i>Kharif and rabi</i>
Pod yield (kg/ha)	1,800-2,000 (<i>kharif</i>)
Kernel yield (kg/ha)	1,386-1,540 (<i>kharif</i>)
Oil content (%)	49.0
Days to maturity	105-110
Distinct morphological feature	Leaflets dark green, obovate to lanceolate; pods, medium, reticulation shallow; whitish red testa
Special feature	High shelling percentage (75-77%); possesses fresh Seed dormancy (up to 30 days)



22. GG-20 (Gujarat Groundnut-20)

Year of release	1992
Notification number	S.O. 814(E) dated 04.11.1992
Developed by	GAU, Junagadh
Pedigree	GAUG-10 x R-33-1
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,960
Kernel yield (kg/ha)	1,439
Oil content (%)	50.7
Days to maturity	109
Distinct morphological feature	Leaflets dark green, medium, oblong; pod constriction and reticulation slight; kernels large with rose testa
Special feature	Early maturity



23. ICGS-5 (ICGV-87121)



Year of release	1992
Notification number	S.O. 615(E) dated 17.8.1993
Developed by	ICRISAT, Hyderabad
	(Robut-33-1 x NCAc-316) F2
Breeding method	Bulk pedigree method
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,385
Kernel yield (kg/ha)	1,622
Oil content (%)	50.9
Days to maturity	110-120
Distinct morphological feature	Leaflets dark green, small, elliptic; kernels medium with tan testa
Special feature	Drought tolerant; resistant to rust

24. BAU-13 (Birsa bold-1)

Year of release	1993
Notification number	S.O. 636(E) dated 02.09.1994
Developed by	BAU, Kanke
Pedigree	BAU-6 x M-13
Breeding method	Pedigree method
Area of adoption	Bihar
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,191
Kernel yield (kg/ha)	1,380
Oil content (%)	48.0
Days to maturity	125-135
Distinct morphological feature	Leaflets green, small, oblong; pod reticulation prominent; kernels bold (71g/100 kernel) with red testa
Special feature	Bold seeded; tolerant of leaf spots, collar rot and PBNB



25. Koyana (B-95)

Year of release	1993
Notification number	Released by Maharashtra State
Developed by	MPKV, Rahuri
Pedigree	M-13 x Shulamith
Breeding method	Pedigree method
Area of adoption	Southern Maharashtra
Recommended production system	<i>Kharif</i> and <i>rabi</i> -summer
Pod yield (kg/ha)	3,345 (<i>rabi</i> -summer)
Kernel yield (kg/ha)	2,275 (<i>rabi</i> -summer)
Oil content (%)	48.0
Days to maturity	115 -125
Distinct morphological feature	Leaflets large, oblong, dark green; extra bold kernels (90g/100 kernel) with pinkish red testa
Special feature	Resistant to LLS and PBND; extra bold seeded (90 g/100 kernels)



26. ICGV-86325



Year of release	1994
Notification number	S.O. 408(E) dated 04.05.1995
Developed by	ICRISAT, Hyderabad
Pedigree	ICGS-20 x G-201
Breeding method	Bulk pedigree method
Area of adoption	Southern Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,700
Kernel yield (kg/ha)	1,890
Oil content (%)	45.0
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green, medium, elliptic; pod with moderate constriction, beak prominent; kernels small with tan testa
Special feature	Tolerant of rust, LLS and PBND

27. Mukta (DRG-17)

Year of release	1994
Notification number	S.O. 408(E) dated 04.05.1995
Developed by	DOR, Hyderabad
Pedigree	R-33-1 x TAP-5
Breeding method	Pedigree method
Area of adoption	Rajasthan, Punjab, Uttar Pradesh and Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,365
Oil content (%)	49.0
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green, medium, oblong; pod smooth; kernels medium with dark pink testa
Special feature	Tolerant of moisture stress, rust, LLS and PBND



28. M-522

Year of release	1995
Notification number	S.O. 1(E) dated 01.01.1996
Developed by	PAU, Ludhiana
Pedigree	PG -1 x F334-AB-14
Breeding method	Pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,525
Kernel yield (kg/ha)	1,717
Oil content (%)	51.0
Days to maturity	110-120
Distinct morphological feature	Leaflets green, small, oblong; kernels large (65g/100 kernel) with Salmon testa
Special feature	Early maturity; tolerant of ELS



29. HNG-10



Year of release	1998
Notification number	S.O. 425(E) dated 08.06.1999
Developed by	RAU, Hanumangarh
Pedigree	GG-11 x R-33-1
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab, Rajasthan and Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,918
Kernel yield (kg/ha)	1,362
Oil content (%)	51.0
Days to maturity	125-130
Distinct morphological feature	Leaflets dark green, medium, oblong; kernels medium with tan testa
Special feature	High shelling per cent (71%)

30. Sneha

Year of release	1998
Notification number	S.O. 937(E) dated 04.09.2002
Developed by	KAU, Vellayani
Pedigree	IES-883 x JL-24
Breeding method	Pedigree method
Area of adoption	Kerala
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	3,827
Kernel yield (kg/ha)	-
Oil content (%)	-
Days to maturity	-
Distinct morphological feature	Small pods, constriction shallow
Special feature	Early maturity

31. Snigdha

Year of release	1998
Notification number	S.O. 937(E) dated 04.09.2002
Developed by	KAU, Vellayani
Pedigree	Dh (E)-32 x JL-24
Breeding method	Pedigree method
Area of adoption	Kerela
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	3,556
Kernel yield (kg/ha)	-
Oil content (%)	-
Days to maturity	-
Distinct morphological feature	Small pods, construction shallow
Special feature	Early maturity

32. Prakash (CSMG-884)



Year of release	1999
Notification number	S.O. 425(E) dated 08.06.1999
Developed by	CSAUA&T, Mainpuri
Pedigree	Kaushal x Chandra
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab and Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,281
Kernel yield (kg/ha)	1,528
Oil content (%)	49.0
Days to maturity	115-125
Distinct morphological feature	Leaflets dark green, medium, oblong; pod beak prominent; kernels bold with light rose testa
Special feature	-

33. Manjra (LGN-2)

Year of release	2000
Notification number	S.O. 92(E) dated 02.02.2001
Developed by	MAU, Latur
Pedigree	R-33-1 x TMV-10
Breeding method	Pedigree method
Area of adoption	Gujarat and southern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,750
Kernel yield (kg/ha)	1,208
Oil content (%)	49.0
Days to maturity	115 -120
Distinct morphological feature	Leaflets dark green, medium, oblong; rose testa
Special feature	Suitable for early sown rain-fed conditions



34. GG-21 (JSSP-15)

Year of release	2005
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	JAU, Junagadh
Pedigree	Somnath x NcAc-2232
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab and northern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,843
Kernel yield (kg/ha)	1,180
Oil content (%)	53.0
Days to maturity	123
Distinct morphological feature	Leaflets dark green, medium, elliptic; pods 2-seeded, constriction and reticulation moderate; flesh testa
Special feature	Possesses high oil content



35. Co (GN)-5

Year of release	2005
Notification number	S.O. 1177(E) dated 25.08.2005
Developed by	TNAU, Coimbatore
Pedigree	(CO-2 x ICGS-86010) x (CO-2 x VG-119 x ICGS-50)
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,585
Kernel yield (kg/ha)	1,170
Oil content (%)	53.1-53.8
Days to maturity	125
Distinct morphological feature	Leaflets dark green, small to medium, obovate; pod constriction and reticulation medium; kernels with red testa
Special feature	Tolerant of rust, PBNB, leaf miner and <i>Spodoptera litura</i> ; possesses high oil content

36. AK-265



Year of release	2007
Notification number	S.O. 1703(E) 05.10.2007
Developed by	PDKV, Akola
Pedigree	ICGS-11 x US-63
Breeding method	Pedigree method
Area of adoption	Southern Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,903
Kernel yield (kg/ha)	1,294
Oil content (%)	47.0
Days to maturity	120
Distinct morphological feature	Leaflets dark green, medium; pod constriction slight and reticulation moderate; pods 2-seeded; rose testa
Special feature	Drought tolerant; resistant to rust and LLS

37. AK-303

Year of release	2007
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	PDKV, Akola
Pedigree	(ICGV-88384 x JL-24) x (ICGV-88438 x ICG-5240)
Breeding method	Pedigree method
Area of adoption	Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,100
Kernel yield (kg/ha)	1,512
Oil content (%)	49.0
Days to maturity	125
Distinct morphological feature	Leaflets dark green, broad, elliptic; tan testa
Special feature	Bold seeded (80 g/100 kernel)



38. TBG-39 (TG-39)

Year of release	2007
Notification number	S.O. 2458(E) dated 16.10.2008
Developed by	RAU, Bikaner
Pedigree	TAG-24 x TG-19
Breeding method	Pedigree method
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	3,154
Kernel yield (kg/ha)	2,050
Oil content (%)	50.0
Days to maturity	118
Distinct morphological feature	Semi-dwarf with large pods
Special feature	Bold seeded (66.8 g/100 kernel)

39. Girnar-2 (PBS-24030)



Year of release	2008
Notification number	S.O. 72(E) dated 10.01.2008
Developed by	NRCG, Junagadh
Pedigree	Selection from M-13 x R-33-1
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab and northern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,907
Kernel yield (kg/ha)	2,006
Oil content (%)	51.0
Days to maturity	130
Distinct morphological feature	Leaflets green, small, lanceolate; pod constriction slight and reticulation moderate; rose testa
Special feature	Tolerant of rust, LLS, PSND and sucking pests; leaves remain green till harvest; bold seeded (62.0 g/100 kernel)

40. ICGV-00348

Year of release	2008
Notification number	S.O. 2458(E) dated 16.10.2008
Developed by	TNAU, Viridhachalam
Pedigree	ICGV-87290 x ICGV-87846
Breeding method	Pedigree method
Area of adoption	Southern Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,013
Kernel yield (kg/ha)	1,329
Oil content (%)	47.0
Days to maturity	124
Distinct morphological feature	Leaflets green, medium lanceolate; pod constriction slight and reticulation moderate; rose testa
Special feature	Tolerant of leaf spots and rust



41. VRI (Gn)-7



Year of release	2008
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	TNAU, Viridhachalam
Pedigree	TMV-1 x JL-24
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,865
Kernel yield (kg/ha)	1,343
Oil content (%)	48.0
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green, ovate; pod constriction and reticulation moderate; rose testa
Special feature	Tolerant of leaf miner, LLS and rust

42. Kadiri-7

Year of release	2009
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	ANGRAU, Kadiri
Pedigree	{ICGV-86522 x ICG (FDRS) 10} x ICGV-91172
Breeding method	Modified bulk pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>kharif</i>
Pod yield (kg/ha)	1,643
Kernel yield (kg/ha)	1,117
Oil content (%)	47
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green; pod constriction and reticulation absent; pods 2-3-seeded; rose testa
Special feature	Tolerant of sucking pests and LLS; bold seeded (65-75g /100 kernel)



43. Kadiri-8

Year of release	2009
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	ANGRAU, Kadiri
Pedigree	{ICGV-86522 x ICG (FDRS) 10} x ICGV-91172
Breeding method	Modified bulk pedigree method
Area of adoption	Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,523
Kernel yield (kg/ha)	1,051
Oil content (%)	47.0
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green; pod constriction slight, reticulation absent; pods 2-seeded; rose testa
Special feature	Tolerant of sucking pests and leaf spots; bold seeded (65-75 g /100 kernel)



44. Mallika (ICHG-00440)



Year of release	2009
Notification number	S.O. 2187(E) dated 27.08.2009
Developed by	RAU, Hanumangarh
Pedigree	(ICGV-88386 x ASHFORD) x ICGV-95172 F2-SSD-B1-B1-B3-B1
Breeding method	Modified pedigree method
Area of adoption	All India
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,579
Kernel yield (kg/ha)	1,754
Oil content (%)	48.0
Days to maturity	125-130
Distinct morphological feature	Leaflets dark green, medium, elliptic; pod constriction and reticulation medium; pods 2-seeded; tan testa
Special feature	Bold seeded (73.0 g /100 kernel); resistant to collar rot and PBNB

45. TGLPS-3 (TDG-39)

Year of release	2009
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	UAS, Dharwad
Pedigree	TAG-24 x TG-19
Breeding method	Pedigree method
Area of adoption	Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,500-3,000
Kernel yield (kg/ha)	1,750-2,100
Oil content (%)	46.0
Days to maturity	115-120
Distinct morphological feature	Leaflets light green, bold kernels
Special feature	Bold seeded (66.8g /100 kernel)



46. HNG-69

Year of release	2010
Notification number	S.O. 211(E) dated 29.01.2010
Developed by	RAU, Hanumangarh
Pedigree	CSMG-84-1 x PG-1
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab, northern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,800
Kernel yield (kg/ha)	1,848
Oil content (%)	50.0
Days to maturity	131
Distinct morphological feature	Leaflets medium elliptic, light green; pod constriction slight, reticulation, moderate; tan testa
Special feature	Tolerant of collar rot, stem rot and ELS



47. Raj Durga (RG 425)

Year of release	2011
Notification number	S.O. 283(E) dated 07.02.2011
Developed by	RAU, Dugrapura
Pedigree	ICG-5013 x RG-340
Breeding method	Pedigree method
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,788
Kernel yield (kg/ha)	1,252
Oil content (%)	50.0
Days to maturity	128
Distinct morphological feature	Leaflets medium, Lanceolate, green; constriction moderate, reticulation prominent; variegated testa
Special feature	-

48. HNG 123

Year of release	2011
Notification number	S.O. 456(E) dated 16.03.2012
Developed by	RAU, Hanumangarh
Pedigree	Chandra x RSB-87
Breeding method	Pedigree method
Area of adoption	Rajasthan, Uttar Pradesh and Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,648
Kernel yield (kg/ha)	1,774
Oil content (%)	49.0
Days to maturity	124
Distinct morphological feature	Leaflets medium, elliptic, green; constriction slight to moderate, reticulation medium; salmon testa
Special feature	Tolerant of <i>Spodoptera litura</i>



49. CO 6

Year of release	2012
Notification number	S.O. 1708(E) dated 26.07.2012
Developed by	TNAU, Coimbatore
Pedigree	CS-9 × ICGS-5
Breeding method	Pedigree method
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,914
Kernel yield (kg/ha)	1,407
Oil content (%)	50.0
Days to maturity	125-130
Distinct morphological feature	Leaflets medium, basal ovobate and upper ellipticoblong, dark green; constriction medium, reticulation moderate; tan testa
Special feature	Resistant to LLS and rust

50. GJG-22 (JSSP-36)



Year of release	2013
Notification number	S.O. 312(E)/01.02.2013
Developed by	JAU, Junagadh
Pedigree	JSSP -17 × GG -20
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,770
Kernel yield (kg/ha)	1,274
Oil content (%)	51.6
Days to maturity	118
Distinct morphological feature	Leaflets medium, oblong, green; pod constriction slight and reticulation medium; rose testa
Special feature	Tolerant of collar rot

D. Habit Group : Virginia Runner

1. TMV-1 (A.H.-25)

Year of release	1940
Notification number	Released by erstwhile Madras state
Developed by	TNAU, Tindivanam
Pedigree	Selection from the west African variety, 'Saloum'
Breeding method	Mass selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,450
Kernel yield (kg/ha)	1,066
Oil content (%)	50.0
Days to maturity	140
Distinct morphological feature	Leaflets small, dark green; pods medium, thin shelled, occasionally 3- seeded; rose testa
Special feature	Drought tolerant



2. TMV-3 (A.H.-698; Coromandel)



Year of release	1943
Notification number	Released by erstwhile Madras state
Developed by	TNAU, Tindivanam
Pedigree	Selection from the west African variety, 'Bassi'
Breeding method	Pure line selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,450
Kernel yield (kg/ha)	1,112
Oil content (%)	50.0
Days to maturity	140
Distinct morphological feature	Leaflets small, dark green; pods medium sized, thin shelled; kernels small to medium; rose testa
Special feature	-

3. TMV-4 (A.H.-334)

Year of release	1947
Notification number	Released by erstwhile Madras state
Developed by	TNAU, Tindivanam
Pedigree	Selection from south American variety 'North Carolina'
Breeding method	Pure line selection
Area of adoption	Tamil Nadu
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,450
Kernel yield (kg/ha)	1,095
Oil content (%)	50.0
Days to maturity	140
Distinct morphological feature	Pods frequently 3-4-seeded; kernels medium bold, elliptic with rose testa
Special feature	-



4. Punjab-1 (Punjab Groundnut No.-1)

Year of release	1953
Notification number	S.O. 361(E) dated 30.06.1973; 786 dated 02.02.1976 Denotified S.O.14 dated 19.12.1978
Developed by	PAU, Ludhiana
Pedigree	Selection from 'Samrala local'
Breeding method	Mass selection
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,900
Kernel yield (kg/ha)	1,311
Oil content (%)	49.0
Days to maturity	120
Distinct morphological feature	Leaflets, green, lanceolate; kernels bold with rose testa
Special feature	Wider adaptability; tolerant of ELS and collar rot; possesses high protein content (27.9%)



5. RS-1



Year of release	1953
Notification number	Rajasthan state release
Developed by	RAU, Durgapura
Pedigree	Selection from local collection of Sawai Madhopur
Breeding method	Mass selection
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,300
Kernel yield (kg/ha)	923
Oil content (%)	45.0
Days to maturity	140-145
Distinct morphological feature	Leaflets green, medium sized; kernels cylindrical, medium bold with rose testa
Special feature	Tolerant of ELS, LLS and rust

6. Karad-4-11

Year of release	1957
Notification number	Released by erstwhile Bombay state and subsequently notified vide S.O. 19(E) dated 14.01.1982
Developed by	MPKV, Karad
Pedigree	Selection from a local cultivar
Breeding method	Mass selection
Area of adoption	Satara, Sangli, Kolhapur and Pune district of Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,000
Kernel yield (kg/ha)	720
Oil content (%)	48.0
Days to maturity	145-150
Distinct morphological feature	Leaflets green, lanceolate; pod medium to long, 1-3-seeded
Special feature	Resistant to ELS; suitable for black soil areas



7. T-28 (Type-28)

Year of release	1960
Notification number	S.O. 13 dated 19.12.1978
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from Bombay collection
Breeding method	Mass selection
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,900
Kernel yield (kg/ha)	1,406
Oil content (%)	48.0
Days to maturity	135
Distinct morphological feature	Pod 3-seeded with prominent beak and reticulation; kernels medium, spherical with light red testa
Special feature	Resistant to ELS



8. S-230 (Selection-230)



Year of release	1969
Notification number	Karnataka state release
Developed by	UAS, Raichur
Pedigree	Selection from 'Tandur local'
Breeding method	Pureline selection
Area of adoption	Northern Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,280
Kernel yield (kg/ha)	896
Oil content (%)	50.0
Days to maturity	130-135
Distinct morphological feature	Leaflets light green, large, oblong; pods with moderate constriction and reticulation; rose testa
Special feature	Drought tolerant

9. Kadiri-71-1

Year of release	1971
Notification number	Andhra Pradesh state release
Developed by	APAU, Kadiri
Pedigree	Selection from 'Ah-288'
Breeding method	Mass selection
Area of adoption	Rayalseema region of Andhra Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,390
Kernel yield (kg/ha)	1,029
Oil content (%)	47.0
Days to maturity	130
Distinct morphological feature	Leaflets dark green, small, oblong; pods with slight constriction, reticulation moderate; kernels small with rose testa
Special feature	Efficient in fixing atmospheric nitrogen



10. M-13 (Moongphali No.-13)

Year of release	1972
Notification number	S.O. 361(E) dated 30.06.1973
Developed by	PAU, Ludhiana
Pedigree	Selection from 'NC-13'
Breeding method	Mass selection
Area of adoption	Originally for Punjab but later adapted in the entire country
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,750
Kernel yield (kg/ha)	1,870
Oil content (%)	49.0
Days to maturity	135
Distinct morphological feature	Leaflets dark green, large, oblong; pod with moderate constriction and reticulation; kernels bold (78g/100 kernels) with tan testa
Special feature	Pods HPS category; tolerant of leaf spots, white grub and aphids



11. GAUG-10 (Gujarat Agril. University Groundnut 10) (Culture No. '4-16')

Year of release	1973
Notification number	S.O. 499(E) dated 08.07.1983
Developed by	GAU, Junagadh
Pedigree	G-221-31 x GO-343
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,800
Kernel yield (kg/ha)	1,332
Oil content (%)	50.0
Days to maturity	110-120
Distinct morphological feature	Leaflets, dark green, large, oblong; pods medium sized, constriction slight; rose testa
Special feature	Resistant to LLS and rust

12. Faizpur 1-5

Year of release	1976
Notification number	S.O. 786 dated 02.02.1976
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from locally introduced bulk samples of Faizpur in east Khandesh district
Breeding method	Mass selection
Area of adoption	Terai areas of Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,500-2,000
Kernel yield (kg/ha)	1,080-1,440
Oil content (%)	48.0-52.7
Days to maturity	100-115
Distinct morphological feature	-
Special feature	High oil content; tolerant of aflatoxin contamination

13. Chandra (Ah-114)

Year of release	1977
Notification number	S.O. 13 dated 19.12.1978
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from 'Ah-114'
Breeding method	Mass selection
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,500
Kernel yield (kg/ha)	1,750
Oil content (%)	47.7
Days to maturity	130
Distinct morphological feature	Leaflets green, large, oblong; pods bold; rose testa
Special feature	Tolerant of LLS and rust



14. M-37 (Moongphali No. 37)



Year of release	1980
Notification number	S.O. 19(E) dated 14.01.1982
Developed by	PAU, Ludhiana
Pedigree	A-1 x C-6-4-7-2
Breeding method	Pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,650
Kernel yield (kg/ha)	1,139
Oil content (%)	50.5
Days to maturity	115-130
Distinct morphological feature	Leaflets green, small, oblong; light brown testa
Special feature	Tolerant of LLS and rust

15. Chitra (MA 10)

Year of release	1984
Notification number	S.O. 540(E) dated 24.07.1985
Developed by	CSAUA&T, Mainpuri
Pedigree	Spanish 5B-1 x EC-1688
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,420
Oil content (%)	49.0
Days to maturity	130
Distinct morphological feature	Leaflets dark green, large, elliptic; kernels spheroidal, testa variegated (on rose background)
Special feature	Resistant to ELS and rust



16. UF-70-103

Year of release	1984
Notification number	S.O. 540(E) dated 24.07.1985
Developed by	PDKV, Akola
Pedigree	Introduction from USA
Breeding method	Introduction
Area of adoption	Vidharbha and western region of Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,000
Kernel yield (kg/ha)	1,426
Oil content (%)	52.0
Days to maturity	111-126
Distinct morphological feature	Leaflets green, small, oblong; kernels spheroidal, small with rose testa
Special feature	High oil content; tolerant of rust and LLS



17. GG-11 (Gujarat Groundnut-11)



Year of release	1984
Notification number	S.O. 10(E) dated 01.01.1988
Developed by	GAU, Junagadh
Pedigree	M-13 x GAUG-10
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,050
Kernel yield (kg/ha)	1,488
Oil content (%)	48.6
Days to maturity	110-114
Distinct morphological feature	Leaflets dark green, large, oblong; kernels spheroidal, small with rose testa
Special feature	Suitable for pre-monsoon sowing; resistant to rust

18. M-335

Year of release	1986
Notification number	S.O. 10(E) dated 01.01.1988
Developed by	PAU, Ludhiana
Pedigree	M-13 x F-7
Breeding method	Pedigree method
Area of adoption	Sandy soil areas of Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,300
Kernel yield (kg/ha)	1,541
Oil content (%)	49.0
Days to maturity	120-125
Distinct morphological feature	Leaflets dark green, large, oblong; pod bold, reticulation prominent, kernels bold, with light brown testa
Special feature	Early maturity; tolerant of ELS and LLS



19. Somnath (TGS- 1)

Year of release	1990
Notification number	S.O 793(E) dated 22.11.1991
Developed by	BARC, Trombay
Pedigree	TG-18A x M-13
Breeding method	Pedigree method
Area of adoption	Gujarat and Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,900
Kernel yield (kg/ha)	1,374
Oil content (%)	50.1
Days to maturity	110-125
Distinct morphological feature	Leaflets dark green, medium, obovate; pod constriction moderate, beak prominent; bold seeded (60.0 g/100 kernel) with dark rose testa
Special feature	Early maturity; tolerant of ELS and LLS



20. GG-12 (Gujarat Groundnut-12)



Year of release	1992
Notification number	S.O. 814(E) dated 04.11.1992
Developed by	GAU, Junagadh
Pedigree	Shulamith x GAUG-10
Breeding method	Bulk pedigree method
Area of adoption	Saurashtra and other region of Gujarat except for northern Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,305
Kernel yield (kg/ha)	899
Oil content (%)	49.5
Days to maturity	112-115
Distinct morphological feature	Leaflets dark green, medium, oblong; pod constriction shallow, reticulation prominent, beak absent; kernels spheroidal with rose testa
Special feature	Early maturity

21. Ambar (CSMG-84-1)

Year of release	1992
Notification number	S.O. 615(E) dated 17.08.1993
Developed by	CSAUA&T, Mainpuri
Pedigree	Selection from MA 10
Breeding method	Mass selection
Area of adoption	Uttar Pradesh, Rajasthan and Haryana
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,704
Kernel yield (kg/ha)	1,731
Oil content (%)	50.4
Days to maturity	125
Distinct morphological feature	Leaflets dark green, small, oblong; pod reticulation prominent; variegated testa
Special feature	Resistant to rust and leaf spots



22. DSG-1

Year of release	1997
Notification number	S.O. 647(E) dated 09.09.1997
Developed by	UAS, Dharwad
Pedigree	Selection from 'Mardur local'
Breeding method	Mass selection
Area of adoption	Karnataka
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,700
Kernel yield (kg/ha)	1,139
Oil content (%)	49.0
Days to maturity	130-135
Distinct morphological feature	Leaflets light green, small; pod beak prominent, curved; kernel spheroidal with tan testa
Special feature	Suitable for transitional zone for rain-fed conditions



23. GG-14 (JSP-28)



Year of release	2003
Notification number	S.O. 283(E) dated 12.03.2003
Developed by	JAU, Junagadh
Pedigree	Gg-11 x R-33-1-90-215-1-B-2-B-B
Breeding method	Pedigree method
Area of adoption	Northern Rajasthan, Punjab, Haryana and Uttar Pradesh
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,159
Kernel yield (kg/ha)	1,403
Oil content (%)	52.0
Days to maturity	123
Distinct morphological feature	Leaflets light green, medium; pod constriction shallow; pink testa
Special feature	High oil content; tolerant of thrips, <i>Spodoptera litura</i> and leaf miner

24. Utkarsh (CSMG-9510)

Year of release	2005
Notification number	S.O. 449(E) dated 11.02.2009
Developed by	CSAUA&T, Mainpuri
Pedigree	MA-10 x ICG-7894
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh, Punjab and northern Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,192
Kernel yield (kg/ha)	1,447
Oil content (%)	49.0
Days to maturity	125
Distinct morphological feature	Leaflets dark green, pod constriction medium; rose testa
Special feature	Possesses fresh seed dormancy (up to 40 - 45 days)

25. Durga (RG-382)

Year of release	2005
Notification number	S.O. 122(E) dated 02.02.2005
Developed by	RAU, Durgapura
Pedigree	BG-2 x Tiftran
Breeding method	Pedigree method
Area of adoption	Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,203
Kernel yield (kg/ha)	1,410
Oil content (%)	50.0
Days to maturity	129
Distinct morphological feature	Leaflets dark green, pod 2-seeded; red rose testa
Special feature	Suitable for sandy and loamy soils; resistant to jassids, leaf miner and thrips



26. GG-16 (JSP-39)

Year of release	2006
Notification number	S.O. 1572(E) dated 20.09.2006
Developed by	JAU, Junagadh
Pedigree	JSP-14 x JSSP-4 S-94-15-B-10-1-B-B
Breeding method	Pedigree method
Area of adoption	Tamil Nadu, Andhra Pradesh, Kerala and southern Maharashtra
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,058
Kernel yield (kg/ha)	1,297
Oil content (%)	46.0
Days to maturity	115-121
Distinct morphological feature	Leaflets green, medium; pod reticulation prominent; rose testa
Special feature	Tolerant of PBND, root rot diseases, thrips, <i>Spodoptera litura</i> and leaf miner

27. M-548

Year of release	2007
Notification number	S.O. 1178(E) dated 20.07.2007
Developed by	PAU, Ludhiana
Pedigree	M-37 x Blanco Puro White
Breeding method	Pedigree method
Area of adoption	Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,186
Kernel yield (kg/ha)	1,508
Oil content (%)	51.4
Days to maturity	123
Distinct morphological feature	Leaflets dark green, medium; purple red testa
Special feature	High protein content; bold kernel; tolerant of leaf spots and collar rot



28. GJG-HPS-1 (JSP-HPS-44)

Year of release	2010
Notification number	S.O. 2137(E) dated 31.08.2010
Developed by	JAU, Junagadh
Pedigree	JSP-21 x VG -5
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,125
Kernel yield (kg/ha)	1,437
Oil content (%)	49.0
Days to maturity	110-120
Distinct morphological feature	Leaflets green, medium elliptic; pod reticulation moderate; rose testa
Special feature	Bold kernels (76g/100 kernel)



29. Divya (CSMG-2003-19)



Year of release	2011
Notification number	S.O. 2326(E)/10.10.2011
Developed by	CSAUA&T, Mainpuri
Pedigree	Amber x ICG -1697
Breeding method	Pedigree method
Area of adoption	Uttar Pradesh and Rajasthan
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,757
Kernel yield (kg/ha)	1,792
Oil content (%)	49.0
Days to maturity	129
Distinct morphological feature	Leaflets small, dark green; pod constriction medium and reticulation prominent; rose testa
Special feature	Tolerant of PBNB

30. Raj Mungfali 1 (RG 510)

Year of release	2012
Notification number	S.O. 456(E) dated 16.03.2012
Developed by	SKRAU, Durgapura
Pedigree	RG-318 x RG-340
Breeding method	Bulk pedigree method
Area of adoption	Rajasthan and Punjab
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	2,558
Kernel yield (kg/ha)	1,739
Oil content (%)	49.0
Days to maturity	112-138
Distinct morphological feature	Leaflets small, lanceolate, dark green; constriction and reticulation moderate; rose testa
Special feature	Bold kernels (76g/100 kernel)



31. GJG-17 (JSP-48)

Year of release	2013
Notification number	S.O. 312(E)/01.02.2013
Developed by	JAU, Junagadh
Pedigree	JSSP - 11 × GG-6
Breeding method	Pedigree method
Area of adoption	Gujarat
Recommended production system	<i>Kharif</i>
Pod yield (kg/ha)	1,798
Kernel yield (kg/ha)	1,187
Oil content (%)	48.0
Days to maturity	121
Distinct morphological feature	Leaflets small, lanceolate, green; pod constriction slight and reticulation medium; rose testa
Special feature	Tolerant of stem rot



References

- Abdou YAM. 1966. The sources and nature of resistance in *Arachis* L. species to *Mycosphaerella arachidicola* Jenk and *Mycosphaerella berkeleyii* Jenk and factors influencing sporulations of these fungi. Ph.D thesis, N C State University, Raleigh.
- Badami VK. 1936. *Arachis hypogaea* L. Groundnut or peanut: Original habitat and its distribution in the world. *Journal of Mysore Agricultural and Experimental Union* 15 (4):141-154.
- Bensen. 1914. The Groundnut (*Arachis hypogaea* L). Department of Agriculture, Madras. Bulletin No. 37-Vol. II.
- Birthal PS, Parthasarathy Rao P, Nigam SN, Bantilan CS and Bhagavatulu S. 2010. Groundnut and soybean economies in Asia: Facts, trends and outlook. Patancheru 502324, Andhra Pradesh, India, International Crops Research Institute for the Semi-Arid Tropics, pp 22-26
- Burn EE and Huffmann VL. 1975. Food quality and peanut products. In: Peanut Production in Texas (Miller, J.E. ed.), Texas Agricultural Experiment Station, Texas p. 127.
- Cobb WY and Johnson BR. 1973. Physico-chemical properties of peanuts. In: Peanuts-culture and Uses, American Peanut Research and Education Society, Stone Printing Co., Raonoke, USA. pp 209-61.
- Coffelt TA. 1989. Peanut. In: Oil Crops of the World: Their Breeding and Utilization (Robbelen G, Downey RK, and Ashri A eds.) McGraw-Hill Publishing Company, New York. pp. 319-338.
- Cox FR. 1979. Effect of temperature treatment on peanut vegetative and fruit growth. *Peanut Science* 6:14-17.
- Craufurd PQ, Whelar TR, Ellis RH, Summerfield RJ and Williams JH. 1999. Effect of temperature and water deficit on WUE, carbon isotopes discrimination and specific leaf area in peanut. *Crop Sci.* 39 (1): 136-142.
- Culp TW, Bailey WK and Hammons RO. 1968. Natural hybridization of Peanut (*Arachis hypogaea* L.) in Virginia. *Crop Sci.*, 8:109-111
- DAC 2012. <http://dacnet.nic.in>
- Dwivedi SL, Jambunathan R, Nigam SN, Raghunath K, Ravi Shankar K and Nagabhushanam GVS. 1990. Relationship of seed mass to oil and protein contents in peanut. *Peanut Sci.* 17:48-52
- FAOSTAT 2012. <http://faostat.fao.org>
- Foretanier EJ. 1957. Control of flowering in *Arachis hypogaea* L. Med. Landbouwhogeschool, Wageningen, 57: 1-116
- Gregory WC, Gregory MP, Krapovickas A, Smith BW and Yarbrough JA. 1973. Structures and genetic resources of peanuts. In: Peanuts-Culture and Uses. Amer. Peanut Res. Educ. Soc., Stillwater, OK. pp. 47-133.
- Hammons RO. 1982. Origin and early history of the peanut. In: Peanut Science and Technology. (Pattee HE and Young CT eds.) American Peanut Research and Education Society, Yoakum, Texas, USA. pp. 1-20.
- Hammons RO and Leuck DB. 1966. National cross pollination of the Peanut (*Arachis hypogaea* L.). *Agron. J.* 55:396.
- IBPGR, ICRISAT. 1985. Descriptors for Groundnut (Revised). International Board for Plant Genetic Resources, Rome and International Crop Research Institute for the Semi-Arid Tropics, Patancheru, India. pp. 8-9.
- Jambunathan R, Raju SM and Barde SP. 1985. Analysis of oil content of groundnut by Nuclear Magnetic Resonance Spectrometry, *J. Sci. Food Agric.* 36:162-166.

-
- John CM, Venkatanarayana G and Seshadri CR. 1955. Varieties and forms of groundnut. *Indian J. Agric. Sci.* 34:159-193.
- Kelkar GK. 1911. Groundnut in Bombay Deccan. Dept. of Agri. Bombay. Bulletin No. 41.
- Ketring DL. 1979. Light effects on development of an indeterminate plant. *Plant Physiology*, 64:665-667.
- Ketring DL, Brown RH, Sullivan GH and Johnson BB. 1982. Growth physiology. In: *Groundnut Science and Technology* (Pattee HE and Young CT. eds.), pp. 411-457. Yoakum, Texas: American Groundnut Research and Education Society.
- Krapovickas A. 1969. The origin, variability and spread of the groundnut (*Arachis hypogaea* L.). In: *The domestication and exploitation of plants and animals* (Ucko PJ and Dimbleby JW eds.), Chicago, Aldine. pp. 427-441.
- Krapovickas A. 1973. Evolution of the genus *Arachis*. In: *Agricultural Genetics-Selected Topics*, pp. 135-151 (Moav, R. ed.) NCRD, Jerusalem, Israel.
- Krapovickas A and Rigoni, VA. 1951. Estudios citológicos en el género *Arachis*. *Revista Invest. Agríc.* 5(3): 289-293.
- Krapovickas A and Gregory WC. 1994. Taxonomy of the genus *Arachis* (Leguminosae). *Bonplandia*, 8, 1-186.
- Krapovickas A and Rigoni RA. 1951. *Estudios citológico en el genero Arachis. Revista de investigaciones agricolas* 5: 289-294.
- Leiberherr E. 1928. A few notes on Indian Groundnuts. The Times Press, Bombay.
- Moss JP and Rao VR. 1995. The Peanut Reproductive development to plant maturity. In: *Advances in Peanut Science* (Patee, HE and Stulker, HT eds.), American Peanut Research and Education Society, Inc. Stillwater, OK 74078, USA. pp. 1-13.
- Nagaraj, G. 1988. Chemistry and Utilization. In: *Groundnut* (Reddy PS ed.) Indian Council of Agriculture Research, New Delhi. pp. 555-565.
- Nigam SN, Rao RCN, Wynne JC, Williams JH, Fitzner M and Nagabhushanam GVS. 1994. Effect and interaction of temperature and photoperiod on growth and partitioning in three groundnut (*Arachis hypogaea* L.) genotypes. *Annals of Applied Biology* 125: 541-552.
- Nigam SN, Nageswara Rao RC, Wynne JC. 1998. Effects of temperature and photoperiod on vegetative and reproductive growth of groundnut (*Arachis hypogaea* L.). *Journal of Agronomy and Crop Science* 181:117-124.
- Nwokolo E. 1996. Peanut (*Arachis hypogaea* L.). In: *Food and feed from legumes and oilseeds* (Nwokolo E. and Smartt J. eds.). Chapman and Hall, New York. pp. 49-63.
- Raheja RK, Batta SK, Ahuja KL, Labana KS and Singh M. 1987. *Plants Food for Human Nutrition* 37, 103-108.
- Rathnakumar AL, Hariprasanna, K and Lalwani, HB. 2010. Genetic improvement in Spanish type groundnut (*Arachis hypogaea* L.) varieties in India over the years. *Indian Journal of Oilseeds Research*. Vol. 27: 1-7.
- Rao VR and Sadasivan AK. 1989. Status of the world collection of groundnut germplasm at ICRISAT. In: *Collaboration on Genetic Resources*. ICRISAT, Patancheru, India. pp. 35-39.

Reddy PS. 1988. Genetics, Breeding and Varieties In: Groundnut (Reddy PS ed.) Indian Council of Agriculture Research, New Delhi. pp. 200-317.

Salunkhe DK Chavan K, Adsule RN and Kadam SS. 1992. Peanut. In: World oilseeds. Chemistry, Technology, and Utilization. Van Nostrand Reinhold Publ. Co., New York. pp.140-216.

Seshadri CR. 1962. Groundnut. The Indian Central Oilseeds Committee, Hyderabad, Andhra Pradesh. p274.

Singh AK and Nigam SN. 1996. Gains in groundnut productivity illustrate success of resistance breeding based on exotic germplasm. *Diversity* 12 : 59-60

Smith AF. 2002. Peanuts: The illustrious History of Goober pea. Urbana, Chicago: University of Illinois press. pp.234

Smith BW. 1950. *Arachis hypogaea* L. Aerial flower and subterranean fruit. *American Journal of Botany*, 37: 802-815

Summerfield RJ and Roberts EH. 1985. *Arachis hypogaea* L. In: CRC Hand Book of Flowering, Vol. I (Halvey AH ed.), CRC Press Boca Raton, Florida. pp. 74-82

USDA Foreign Agricultural Service. <http://www.fas.usda.gov>

Williams JH, Wilson JHH and Bate GC. 1975. The growth of groundnuts (*Arachis hypogaea* L. cv. Makulu Red) at three altitudes in Rhodesia. *Rhodesian Journal of Agricultural Research*, 13: 33-43.

Watt G. 1908. The commercial products of India, (Revised edition, 1976) Today and tomorrow printers and publishers, New Delhi. pp. 74-83.

Weiss EA. 2000. Groundnut. In: Oilseed crops. Longman Inc., New York. pp.100-160.

Witzenberger A, Williams JH and Lenz F. 1988. Influences of daylength on yield determining process in six groundnut cultivars (*Arachis hypogaea* L.). *Field Crops Res.*, 18:89-100.

www.agricrops.com

www.seaofindia.com

Annexure I: State and season-wise area, production and yield of groundnut crop during last five years (2007-08 to 2011-12)

A=Area in lakh hectares, P=Production in lakh tonnes and Y=Yield in kg/ha

State	2007-08			2008-09			2009-10			2010-11			2011-12		
	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total
Gujarat	A 17.120	1.450	18.570	17.930	1.190	19.120	17.570	0.650	18.220	16.910	1.150	18.060	14.540	2.320	16.860
	P 30.490	2.500	32.990	24.510	2.140	26.650	16.330	1.240	17.570	31.590	2.071	33.661	22.730	4.440	27.170
	Y 1781	1724	1777	1367	1798	1394	929	1908	964	1868	1801	1864	1563	1914	1612
Andhra Pradesh	A 15.000	2.950	17.950	14.990	2.660	17.650	10.110	2.900	13.010	13.470	2.750	16.220	10.570	2.500	13.070
	P 20.360	5.680	26.040	10.392	5.140	15.532	3.890	6.170	10.060	8.880	5.700	14.580	3.820	4.620	8.440
	Y 1357	1925	1451	693	1932	880	385	2128	773	659	2073	899	361	1848	646
Tamil Nadu	A 3.613	1.740	5.353	2.994	2.491	5.485	2.850	1.280	4.130	2.681	1.174	3.855	2.491	1.365	3.856
	P 5.120	5.356	10.476	5.403	5.295	10.698	4.920	3.980	8.900	5.046	3.911	8.957	5.485	5.122	10.607
	Y 1417	3078	1957	1805	2126	1950	1728	3104	2155	1882	3333	2324	2202	3751	2751
Karnataka	A 7.370	1.710	9.080	6.710	1.450	8.160	6.090	2.090	8.180	6.590	1.890	8.480	5.090	1.680	6.770
	P 5.780	1.550	7.330	4.064	1.240	5.304	3.440	1.680	5.120	5.620	1.800	7.420	3.310	1.540	4.850
	Y 784	906	807	606	855	650	565	804	626	853	952	875	650	917	716
Maharashtra	A 3.290	0.750	4.040	2.540	0.860	3.400	2.600	0.610	3.210	2.750	0.820	3.570	2.380	0.650	3.030
	P 3.660	1.060	4.720	2.660	1.210	3.870	2.640	0.950	3.590	3.460	1.140	4.600	2.570	0.940	3.510
	Y 1112	1413	1168	1047	1407	1138	1015	1557	1118	1258	1390	1289	1080	1446	1158
Rajasthan	A 2.763	-	2.763	3.215	-	3.215	3.260	-	3.260	3.469	-	3.469	4.147	0.035	4.181
	P 4.774	-	4.774	5.368	-	5.368	3.540	-	3.540	6.811	-	6.811	8.006	0.047	8.054
	Y 1728	-	1728	1670	-	1670	1087	-	1087	1963	-	1963	1931	1370	1926
Madhya Pradesh	A 1.987	-	1.987	1.997	-	1.997	1.880	-	1.880	2.016	-	2.016	2.130	-	2.130
	P 1.868	-	1.868	2.276	-	2.276	2.180	-	2.180	3.016	-	3.016	3.446	-	3.446
	Y 940	-	940	1140	-	1140	1158	-	1158	1496	-	1496	1618	-	1618
Orissa	A 0.336	0.505	0.841	0.343	0.478	0.821	0.340	0.420	0.760	0.351	0.377	0.728	0.299	0.364	0.663
	P 0.330	0.695	1.025	0.337	0.597	0.934	0.330	0.560	0.890	0.343	0.513	0.856	0.248	0.540	0.788
	Y 982	1376	1219	983	1249	1138	968	1334	1169	977	1361	1176	830	1486	1189
West Bengal	A 0.033	0.659	0.692	0.024	0.700	0.724	0.020	0.640	0.660	0.022	0.599	0.622	0.015	0.530	0.544
	P 0.030	1.297	1.327	0.023	1.330	1.353	0.020	1.110	1.130	0.019	1.013	1.032	0.013	1.043	1.056
	Y 909	1968	1918	958	1900	1869	916	1742	1715	849	1690	1660	864	1969	1939

State		2007-08			2008-09			2009-10			2010-11			2011-12		
		Kharif	Rabi- summer	Total	Kharif	Rabi- summer	Total	Kharif	Rabi- summer	Total	Kharif	Rabi- summer	Total	Kharif	Rabi- summer	Total
Uttar Pradesh	A	0.990	-	0.990	0.950	-	0.950	0.910	-	0.910	0.850	-	0.850	0.920	-	0.920
	P	0.592	-	0.592	0.670	-	0.670	0.610	-	0.610	0.840	-	0.840	0.920	-	0.920
	Y	598	-	598	705	-	705	670	-	670	988	-	988	1000	-	1000
Chhattisgarh	A	0.281	-	0.281	0.281	-	0.281	0.290	-	0.290	0.290	-	0.290	0.284	-	0.284
	P	0.353	-	0.353	0.380	-	0.380	0.390	-	0.390	0.424	-	0.424	0.375	-	0.375
	Y	1256	-	1256	1352	-	1352	1353	-	1353	1462	-	1462	1320	-	1320
Arunachal Pradesh	A	-	-	-	-	-	-	0.005	-	-	0.005	-	-	0.005	-	0.005
	P	-	-	-	-	-	-	0.004	-	-	0.004	-	-	0.005	-	0.005
	Y	-	-	-	-	-	-	-	-	-	800	-	-	882	-	882
Goa	A	-	-	-	-	-	-	0.006	0.020	0.030	0.005	0.024	0.029	0.004	0.028	0.032
	P	-	-	-	-	-	-	0.010	0.070	0.080	0.014	0.069	0.083	0.010	0.070	0.080
	Y	-	-	-	-	-	-	2102	2981	2778	2800	2875	2862	2833	2458	2500
Haryana	A	-	-	-	-	-	-	0.020	-	-	0.020	-	0.020	0.030	-	0.030
	P	-	-	-	-	-	-	0.020	-	-	0.020	-	0.020	0.029	-	0.029
	Y	-	-	-	-	-	-	1000	-	-	1000	-	1000	967	-	967
Himachal Pradesh	A	-	-	-	-	-	-	0.002	-	-	0.007	-	0.007	0.001	-	0.001
	P	-	-	-	-	-	-	0.001	-	-	0.005	-	0.005	0.001	-	0.001
	Y	-	-	-	-	-	-	670	-	-	742	-	742	917	-	917
Jharkhand	A	-	-	-	-	-	-	0.140	-	-	0.255	-	0.255	0.170	-	0.170
	P	-	-	-	-	-	-	0.110	-	-	0.233	-	0.233	0.204	-	0.204
	Y	-	-	-	-	-	-	756	-	-	914	-	914	1196	-	1196
Bihar	A	-	-	-	-	-	-	-	-	-	0.004	-	-	0.008	-	0.008
	P	-	-	-	-	-	-	-	-	-	0.004	-	-	0.008	-	0.008
	Y	-	-	-	-	-	-	-	-	-	900	-	-	1025	-	1025
Kerala	A	-	-	-	-	-	-	0.010	-	-	0.015	-	0.015	0.016	0.001	0.017
	P	-	-	-	-	-	-	0.010	-	-	0.019	-	0.019	0.021	0.001	0.022
	Y	-	-	-	-	-	-	763	-	-	1267	-	1267	1346	909	1318
Nagaland	A	-	-	-	-	-	-	0.007	-	-	0.007	-	0.007	0.008	-	0.008
	P	-	-	-	-	-	-	0.006	-	-	0.007	-	0.007	0.008	-	0.008
	Y	-	-	-	-	-	-	786	-	-	1000	-	1000	1013	-	1013
Manipur	A	-	-	-	-	-	-	-	-	-	0.017	-	0.017	0.018	-	0.018
	P	-	-	-	-	-	-	-	-	-	0.010	-	0.010	0.013	-	0.013
	Y	-	-	-	-	-	-	-	-	-	612	-	612	727	-	727

Annexure I contd....

State		2007-08			2008-09			2009-10			2010-11			2011-12		
		<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total	<i>Kharif</i>	<i>Rabi-</i> <i>summer</i>	Total
Punjab	A	-	-	-	-	-	-	0.030	-	-	0.022	-	0.022	0.020	-	0.020
	P	-	-	-	-	-	-	0.030	-	-	0.039	-	0.039	0.030	-	0.030
	Y	-	-	-	-	-	-	1240	-	-	1773	-	1773	1500	-	1500
Tripura	A	-	-	-	-	-	-	0.002	0.002	0.004	0.003	0.003	0.007	0.002	0.004	0.006
	P	-	-	-	-	-	-	0.003	0.002	0.005	0.004	0.003	0.007	0.002	0.005	0.007
	Y	-	-	-	-	-	-	1081	1040	1095	1190	917	1056	1091	1297	1220
Uttarakhand	A	-	-	-	-	-	-	0.010	-	-	0.011	-	0.011	0.010	-	0.010
	P	-	-	-	-	-	-	0.020	-	-	0.012	-	0.012	0.010	-	0.010
	Y	-	-	-	-	-	-	2000	-	-	1071	-	1071	1000	-	1000
Pondichery	A	-	-	-	-	-	-	0.004	-	-	0.004	-	0.004	0.003	0.000	0.003
	P	-	-	-	-	-	-	0.009	-	-	0.008	-	0.008	0.004	0.000	0.005
	Y	-	-	-	-	-	-	2103	-	-	1962	-	1962	1406	1810	1433
Jammu & Kashmir	A	-	-	-	-	-	-	-	-	-	-	-	-	0.00005	-	0.00005
	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D & N Havelli	A	-	-	-	-	-	-	-	-	-	-	-	-	0.00020	-	0.00020
	P	-	-	-	-	-	-	-	-	-	-	-	-	0.00020	-	0.00020
	Y	-	-	-	-	-	-	-	-	-	-	-	-	1000	-	1000
Other States	A	0.338	0.035	0.373	0.362	0.030	0.392	-	-	-	0.041	0.027	0.068	0.000	0.000	0.000
	P	0.267	0.063	0.330	0.288	0.060	0.348	-	-	-	0.047	0.072	0.119	0.000	0.000	0.000
	Y	790	1800	885	796	2000	888	-	-	-	1152	2640	1746	0.000	0.000	0.000
Total All India	A	53.121	9.799	62.920	52.336	9.859	62.195	46.160	8.610	54.770	49.774	8.787	58.561	43.161	9.477	52.637
	P	73.624	18.201	91.825	56.371	17.012	73.383	38.520	15.760	54.280	66.428	16.220	82.648	51.269	18.368	69.637
	Y	1386	1857	1459	1077	1726	1180	835	1830	991	1335	1846	1411	1188	1938	1323

Annexure II: Export data on groundnut (shelled) 2008-2010

S. No	country	2008			2009			2010		
		Quantity (tonnes)	Value (1000 \$)	Unit value (\$/tonne)	Quantity (tonnes)	Value (1000 \$)	Unit value (\$/tonne)	Quantity (tonnes)	Value (1000 \$)	Unit value (\$/tonne)
1	India	293128	274154	935	329160	287229	873	372691	392065	1052
2	China	167054	232183	1390	174663	165133	945	126585	172395	1362
3	United States of America	216936	198593	915	171917	175366	1020	154519	179926	1164
4	Argentina	148962	180890	1214	200636	163326	814	217796	203382	934
5	Netherlands	80287	137390	1711	69583	101751	1462	85107	109518	1287
6	Nicaragua	77973	90058	1155	74665	65859	882	66332	61733	931
7	Brazil	44361	50586	1140	52977	48546	916	50810	47862	942
8	United Arab Emirates	15938	15799	991	15938	15799	991	14216	8850	623
9	South Africa	10202	15027	1473	9461	11889	1257	20790	25619	1232
10	Viet Nam	14300	13700	958	20495	11344	554	11567	12364	1069
11	Belgium	6282	9395	1496	6667	9471	1421	8249	9487	1150
12	Gambia	18000	8200	456	18000	9200	511	7558	5852	774
13	Singapore	6093	7336	1204	5468	5431	993	4281	5236	1223
14	Australia	3984	7254	1821	2487	3604	1449	1775	3215	1811
15	Uzbekistan	6461	5545	858	9137	10726	1174	4250	5930	1395
16	Paraguay	9230	9778	1059	5495	3740	681	-	-	-
17	Egypt	8030	6220	775	21606	31422	1454	-	-	-
18	Bolivia (Plurinational State of)	4056	6658	1642	-	-	-	-	-	-
19	United Republic of Tanzania	14817	6280	424	-	-	-	-	-	-
20	Spain	3275	5874	1794	-	-	-	-	-	-
21	Malawi	-	-	-	19879	17987	905	21772	8896	409
22	Germany	-	-	-	2276	3712	1631	2722	4177	1535
23	France	-	-	-	1288	3494	2713	1156	3250	2811
24	Mozambique	-	-	-	-	-	-	8746	4985	570
25	Greece	-	-	-	-	-	-	2498	4366	1748
	World	1197026	1321016	1104	1244453	1173737	943	1222647	1305177	1068

Annexure IIIa. State-wise latest situation specific most promising groundnut varieties

State	Varieties
Andhra Pradesh	Kadiri-6, Narayani, ICGV-91114, Kadiri-9, GPBD-4, Abhaya, Prasuna, Greeshma, Ajeya, Vijetha, Kadiri Harithandra, ICGV-00350, Kadiri-7, Kadiri-8
Gujarat	GG-2, GG-20, TG-37A, GG-5, GG-6, GG-7, JL-501, GJG-9, GJG-31, TPG-41, Dh 86, GJG-17, GJG-22
Karnataka	GPBD-4, TGLPS-3, Ajeya, Vijetha, VRI (Gn)-6, ICGV-91114, TAG-24, Kadiri Harithandra
Tamil Nadu	VRI-2, VRI (Gn)-6, TMV (Gn)-13, Co (Gn)-5, Co-6, ALR-2, VRI (Gn)-7, GPBD 4, ICGV 00348, ICGV 00350
Maharashtra	AK-159, JL-220, JL-286, JL-501, AK-303, AK-265, Ratneshwar, TLG-45, TAG-24, Dh-86, Kadiri Harithandra
Rajasthan	HNG-10, Girnar-2, TG-37A, Prakash, Amber, Utkarsh, GG-14, GG-21, HNG-69, HNG-123, Raj Mungphali-1, TBG-39, JL 501, Pratap Mungphali-1, Pratap Mungphali-2, Divya (CSMG-2003-19)
Madhya Pradesh	JGN-3, JGN-23, AK-159, GG-8
Jharkhand	BAU-13, Girnar-3, GPBD-5, Vijetha, Dh-86, Dh-101, TG-38B, TG-51
Punjab	M-548, Girnar-2, HNG-10, TG-37A, Prakash, Amber, Utkarsh, GG-14, GG-21, HNG-69, HNG-123, Raj Mungphali-1, SG-99
Uttar Pradesh	Prakash, Amber, Utkarsh, HNG-10, Girnar-2, GG-14, GG-21, TG-37A, HNG-69, HNG-123, Raj Mungphali-1, Dh-86, Divya (CSMG-2003-19)
Uttarakhand	VL Mungphali-1
Orissa	OG-52-1, ICGV-91114, Girnar-3, TAG-24, TG-38B, TG-51, TG-37A, Dh 86, Dh 101
West Bengal	Girnar-3, TAG-24, TG-37A, TG-51, Dh-86, Dh-101, TG-38B
NEH region	BAU-13, ICGS-76, ICGV-86590, GPBD-5, TAG-24, Dh-86, Dh-101, TG-38B, TG-51, TG-37A

Annexure IIb. Salient features of the most promising groundnut varieties

S. No.	Name of variety/ hybrid	Year of release/ notification	Recommended niche	Salient feature	
				Plant type, Maturity group*, seed size	Biotic and Abiotic Stress
1	GG-2 (Gujarat GRoundnut-2)	1983	Summer	Erect, early (105), small seed	High water use efficiency
2	VRI-2	1989	<i>Kharif</i> and <i>rabi</i> -summer	Erect, early (105), medium seed	Tolerant of ELS, LLS and rust
3	ICGS-76 (ICGV-87141)	1989	<i>Kharif</i>	Semi-spreading , medium (118-122), medium bold seed	Resistant to ELS and LLS
4	TAG-24	1991	<i>Kharif</i> and <i>rabi</i> -summer	Erect, semi-dwarf, early (102), small seed	High Harvest Index (>50%) and high water use efficiency
5	ICGV-86590 (ICGS-86)	1991	<i>Kharif</i>	Erect, medium (108), small seed	Multiple diseases (rust, LLS, PBND, stem and pod rots); and insect pest (<i>Spodoptera litura</i>) resistant
6	GG-20 (Gujarat Groundnut-20)	1992	<i>Kharif</i>	Semi-spreading , medium (120), large seed, Suitable for confectionery	-
7	CSMG-84-1 (Ambar)	1992	<i>Kharif</i>	Spreading , late (125-130), medium seed	Tolerant of high temperature, and resistant to ELS and LLS
8	Birsa Bold (BAU-13)	1993	<i>Kharif</i>	Spreading , medium (122), large seed	Tolerant of collar rot and PBND
9	ALR-2 (ALG-56)	1994	<i>Kharif</i>	Erect, early (105), medium seed	Resistant to rust and LLS
10	Smruti (OG-52-1)	1995	<i>Kharif</i> and <i>rabi</i> -summer	Erect, medium (110), medium seed	Resistant to collar rot , stem rot, rust and leaf spots
11	JGN-3 (Jawahar GRoundnut-3)	1997	<i>Kharif</i>	Erect, early (104), small seed	Drought tolerant
12	HNG-10	1998	<i>Kharif</i>	Semi-spreading , late (125-30), medium seed	-
13	GG-5	1999	<i>Kharif</i>	Erect, medium (110), medium seed	Drought tolerant
14	CSMG-884 (Prakash)	1999	<i>Kharif</i>	Semi-spreading, medium (115-125), large seed	Tolerant of leaf spots and PBND
15	Phule Vyas (JL-220)	2000	<i>Kharif</i>	Erect, extra early (90-95), medium seed	-

Annexure IIb. Salient features of the most promising groundnut varieties (contd.)

S. No.	Name of variety/ hybrid	Year of release/ notification	Recommended niche	Salient feature	
				Plant type, Maturity group*, seed size	Biotic and Abiotic Stress
16	GG-7 (J-38)	2001	<i>Kharif</i>	Erect, early (100), medium seed	Tolerant of LLS
17	AK-159	2002	<i>Kharif</i>	Erect, early (106), small seed	-
18	GG-6	2003	<i>Rabi</i> -summer	Erect, early (100), medium seed	-
19	GG-14 (JSP-28)	2003	<i>Kharif</i>	Spreading , medium (123), medium seed	Tolerant of thrips, <i>Spodoptera litura</i> and leaf miner
20	TPG-41	2004	<i>Rabi</i> -summer	Erect, late (122), large seed	-
21	TG-37A	2004	<i>Kharif</i> and <i>rabi</i> -summer	Erect, late (122), small seed	Possesses fresh seed dormancy up to 1 week
22	Vikas (GPBD-4)	2004	<i>Kharif</i>	Erect, early (107), small seed	Resistant to LLS and rust
23	TLG-45	2004	<i>Kharif</i>	Erect, medium (114), large seed	-
24	SG-99	2004	Summer	Erect, early (102), medium seed	Tolerant of PBNB
25	Phule Unap (JL-286)	2004	<i>Rabi</i> -summer	Erect, extra early (93-95), small seed	-
26	Prutha (Dh-86)	2005	<i>Rabi</i> -summer	Erect, late (125-127), small seed	Tolerant of tikka and sucking pests
27	Kadiri 6 (K-1240)	2005	<i>Rabi</i> -summer	Erect, early (100-105), small seed	Tolerant of leaf spots
28	Pratap Mugphali-2 (ICUG-92195)	2005	<i>Kharif</i>	Erect, early (105), small seed	Tolerant of ELS, LLS, PBNB, <i>Spodoptera litura</i> , leaf miner and thrips
29	Pratap Mugphali-1 (ICUG-92035)	2005	<i>Kharif</i>	Erect, early (108), small seed	Tolerant of ELS, LLS, PBNB, <i>Spodoptera litura</i> , leaf miner and thrips
30	Ratneshwar (LGN-1)	2005	<i>Kharif</i>	Erect, early (105), small seed	Tolerant of stem rot
31	Co(GN)-5	2005	<i>Kharif</i>	Semi-spreading , late (125), medium seed	Tolerant of rust, PBNB, leaf miner and <i>Spodoptera litura</i>
32	Utkarsh (CSMG-9510)	2005	<i>Kharif</i>	Spreading , late (125), large seed	-
33	GG-21 (JSSP-15)	2005	<i>Kharif</i>	Semi-spreading , late (123), large seed	-
34	GG-8 (J 53)	2006	<i>Kharif</i>	Erect, early (104-107), small seed	Tolerant of PBNB and collar rot
35	TG-38B (TG-38)	2006	<i>Rabi</i> -summer	Erect, late (115-125), medium seed	Tolerant of stem rot

Annexure IIb. Salient features of the most promising groundnut varieties (contd.)

S. No.	Name of variety/ hybrid	Year of release/ notification	Recommended niche	Salient feature	
				Plant type, Maturity group*, seed size	Biotic and Abiotic Stress
36	Prasuna (TCGS-341)	2006	<i>Kharif</i> and <i>rabi</i> -summer	Erect, medium (110), medium seed	Tolerant of Kalahasti malady
37	Abhaya (TPT-25)	2006	<i>Kharif</i> and <i>rabi</i> -summer	Erect, early (106), small seed	Tolerant of early-and-mid season moisture deficit stress
38	TMV (Gn)-13	2006	<i>Kharif</i>	Erect, early (105-110), medium seed	Tolerant of early-and mid- season moisture stress conditions
39	Vasundhara (Dh-101)	2007	<i>Rabi</i> -summer	Erect, late (120-135), small seed	Tolerant of stem rot, PBNB, thrips and <i>Spodoptera litura</i>
40	ICGV-91114	2007	<i>Kharif</i>	Erect, extra early (90-95), medium seed	Tolerant of drought , LLS and rust
41	Narayani (TCGS-29)	2007	<i>Kharif</i> and <i>rabi</i> -summer	Erect, early (100), medium seed	Tolerant of mid-season moisture deficit stress
42	AK-265	2007	<i>Kharif</i>	Semi-spreading , medium (120), medium seed	Resistant to rust and LLS diseases
43	M-548	2007	<i>Kharif</i>	Spreading , medium (123), large seed	-
44	TBG-39 (TG-39)	2007	<i>Kharif</i>	Semi-spreading , medium (118), large seed	-
45	AK-303	2007	<i>Kharif</i>	Semi-spreading , late (125), large seed	-
46	TG-51	2008	<i>Rabi</i> -summer	Erect, late (124), small seed	Tolerant of stem rot and root rot
47	Ajeya (R-2001-3)	2008	<i>Kharif</i>	Erect, medium (106), small seed	Drought tolerant
48	VL-Moongphali-I	2008	<i>Kharif</i>	Erect, late (125-130), medium seed	Resistant to LLS and root rot
49	Girnar-2 (PBS-24030)	2008	<i>Kharif</i>	Semi-spreading , late (130), large seed	Tolerant of rust and LLS
50	ICGV-00348	2008	<i>Kharif</i>	Semi-spreading , late (124), medium seed	Tolerant of leaf spots and rust
51	VRI (GN)-7	2008	<i>Kharif</i>	Semi-spreading , late (120-125), medium seed	Tolerant of leaf miner, LLS and rust
52	VRI (Gn)-6 (VG-9816)	2009	<i>Kharif</i>	Erect, early (100-106), small seed	Tolerant of LLS, rust, PBNB

Annexure IIb. Salient features of the most promising groundnut varieties (contd.)

S. No.	Name of variety/ hybrid	Year of release/ notification	Recommended niche	Salient feature	
				Plant type, Maturity group*, seed size	Biotic and Abiotic Stress
53	Jawahar Groundnut-23 (JGN-23)	2009	<i>Kharif</i>	Erect, early (104), small seed	Tolerant of ELS and LLS
54	Kadiri-7	2009	<i>Kharif</i>	Semi-spreading , late (120-125), large seed	Tolerant of sucking pest and leaf spots
55	Kadiri-8	2009	<i>Kharif</i>	Semi-spreading , late (120-125), large seed	Tolerant of sucking pest and leaf spots
56	Kadiri-9	2009	<i>Kharif</i>	Erect, early (105-110), small seed	Tolerant of early-and end-of- season drought
57	Greeshma	2009	<i>Kharif</i> and <i>rabi</i> -summer	Erect, early (90-100), medium seed	Tolerant of LLS
58	TGLPS-3 (TDG-39)	2009	<i>Kharif</i>	Semi-spreading , medium (115-120), large seed	-
59	JL-501	2010	<i>Kharif</i>	Erect, early (102), medium seed	-
60	Vijetha (R-2001-2)	2010	<i>Kharif</i>	Erect, medium (105-115), small seed	Resistant to PBNB
61	Girnar-3 (PBS-12160)	2010	<i>Kharif</i>	Erect, early (104-111), small seed	Tolerant of leaf miner and thrips
62	Kadiri Haritandhra (K-1319)	2010	<i>Rabi</i> -summer	Erect, late (122), medium seed	-
63	GPBD-5	2010	<i>Kharif</i>	Erect, early (105-110), small seed	Resistant to LLS and rust
64	HNG-69	2010	<i>Kharif</i>	Semi-spreading, late (131), large seed	Tolerant of collar rot, stem rot and ELS
65	Divya (CSMG-2003-19)	2011	<i>Kharif</i>	Spreading, Medium (129), large seed	Tolerant of PBNB
66	ICGV-00350	2012	<i>Rabi</i> -summer	Erect, medium (114), small seed	Resistant to LLS, rust and tolerant of stem rot
67	HNG-123	2012	<i>Kharif</i>	Semi-spreading , late (124), large seed	Tolerant to collar rot, stem rot and ELS
68	Raj Mungfali-1 (RG-510)	2012	<i>Kharif</i>	Spreading , late (112-138), large seed	Tolerant of collar rot
69	CO-6	2012	<i>Kharif</i>	Semi-spreading , late (125-130), medium seed	Resistant to LLS and rust
70	GJG-31(J-71)	2012	<i>Kharif</i>	Erect, early (103), small seed	Tolerant of stem rot
71	GJG-9 (J-69)	2012	<i>Summer</i>	Erect, medium (117), medium seed	-
72	GJG-17(JSP-48)	2013	<i>Kharif</i>	Spreading , medium (121), small seed	Tolerant of stem rot
73	GJG-22(JSSP-36)	2013	<i>Kharif</i>	Semi-spreading , medium (118), medium seed	Tolerant of collar rot

* Days to maturity ELS=Early Leaf Spot; LLS=Late Leaf Spot and virus, PBNB=Peanut Bud Necrosis Disease

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses

S. No.	States	Varieties	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	
1	Andhra Pradesh	JCG-88 (Jagtial-88)	-	-	-	-	✓	✓	-	-	-	-	-	-
		Kadiri-5	-	✓	-	-	-	-	-	-	-	-	-	✓
		Kadiri-6 (K-1240)	-	✓	-	-	-	-	-	-	-	-	-	-
		Tirupati-2	-	-	-	-	-	-	-	✓	-	-	-	-
		Tirupati-3 (TCG-1518)	-	-	-	-	-	-	-	✓	-	-	-	-
		Kadiri-4 (K-150)	-	✓	-	-	-	✓	-	-	-	-	-	-
		Abhaya (TPT-25)	-	✓	-	-	-	-	-	-	✓	✓	✓	✓
		Kalahasti (TCGS-320)	-	-	-	-	-	✓	-	✓	-	-	-	-
		Vikas (GPBD 4)	-	✓	✓	-	-	-	-	-	-	-	-	-
		Kadiri-9	-	✓	✓	-	✓	-	-	✓	-	-	-	✓
		Greeshma	-	✓	-	-	-	-	-	-	-	-	-	✓
		Kadiri-7	-	-	-	-	-	-	-	-	-	-	✓	-
		Prasuna (TCGS 341)	-	-	-	-	-	-	-	✓	-	-	-	-
		Kadiri-8	-	✓	-	-	-	-	-	-	-	-	✓	-
		Mankya (DRG -12)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		Apoorva (R-8808)	-	✓	-	-	-	✓	-	-	-	-	-	-
		Ajeya (R-2001-3)	-	-	-	-	-	✓	-	-	-	-	-	✓
		VRI (Gn)-6 (VG-9816)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGV-86325	-	✓	✓	-	-	✓	-	-	-	-	-	-
		GG-16 (JSP-39)	-			-	-	✓	-	-	✓	✓	✓	-
		AK-265	-	✓	✓	-	-		-	-	-	-	-	✓
		ICGV-00348	-	✓	✓	-	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-			-	-	✓	-	-	-	-	-	-
		ICGV-91114	-	-	-	-	-	-	-	-	-	-	-	✓
		K-134	✓	✓		-	-	✓	-	-	-	-	-	✓
		Narayani (TCGS-29)	-	-	-	-	-	-	-	-	-	-	-	✓

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses (contd.)

S. No.	State	Variety	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	Drought
2	Tamil Nadu	Mankya (DRG -12)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		Apoorva (R-8808)	-	✓	-	-	-	✓	-	-	-	-	-	-
		Ajeya (R-2001-3)	-		-	-	-	✓	-	-	-	-	-	✓
		VRI (Gn)-6 (VG-9816)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGV-86325	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ALR-2 (ALG -56)	-	✓	✓	-	-	-	-	-	-	-	-	-
		ALR-2 (ALG -63)	-	-	✓	-	-	-	-	-	-	-	-	-
		VRI (Gn)-5	-	✓	✓	-	-	-	-	-	-	-	-	-
		Co (Gn)-4 (TNAU-269)	-	✓	✓	-	-	-	-	-	-	-	-	-
		Co (Gn)-5	-	-	✓	-	-	✓	-	-	✓	-	✓	-
		GG -16 (JSP-39)	-	-	-	-	-	✓	-	-	✓	✓	✓	-
		AK-265	-	-	✓	-	-	-	-	-	-	-	-	✓
		ICGV-00348	-	✓	✓	-	-	-	-	-	-	-	-	-
		Vikas (GPBD-4)	-	✓	✓	-	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
		K 134	-	-	-	-	-	-	-	-	-	-	-	✓
		CO6	-	✓	✓	-	-	-	-	-	-	-	-	-
		TMV-13	-	-	-	-	-	-	-	-	-	-	-	✓
3	Karnataka	Mankya (DRG-12)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		R-9251	-		-	-	-	✓	-	-	-	-	-	-
		Apoorva (R-8808)	-	✓	-	-	-	✓	-	-	-	-	-	-
		Ajeya (R-2001-3)	-	-	-	-	-	✓	-	-	-	-	-	✓
		VRI (Gn)-6 (VG-9816)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGV-86325		✓	✓	-	-	✓	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
		Kadiri Haritandhra (K-1319)	✓	✓	✓	-	-	✓	✓		✓	✓	✓	✓

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses (contd.)

S. No.	State	Variety	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	Drought
4	Mahar- ashtra	Mankya (DRG-12)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		TG 26	-	✓	✓	-	-	✓	-	-	-	-	-	-
		TAG -24	-	✓	-	-	-	✓	-	-	-	-	-	-
		Ratneshwar (LGN-1)	-	-	-	-	-	-	-	-	-	-	✓	-
		Phule Unap (JL-286)	-	✓	✓	✓	-	-	-	-	✓	✓	✓	-
		Ajeya (R-2001-3)	-	-	-	-	-	✓	-	-	-	-	-	✓
		VRI (Gn)-6 (VG -9816)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGV-86325	-	✓	✓	-	-	✓	-	-	-	-	-	-
		GG -16 (JSP-39)	-	-	-	-	-	✓	-	-	✓	✓	✓	-
		AK-265	-	✓	✓	-	-	-	-	-	-	-	-	✓
		ICGV-00348	-	✓	✓	-	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
		Kadiri Haritandhra (K-1319)	✓	✓	✓	-	-	✓	✓	-	✓	✓	✓	✓
5	Gujarat	GG-7 (J-38)	-	✓	-	-	-	-	-	-	-	-	-	-
		Somnath (TGS-1)	-	✓	-	-	-	-	-	-	-	-	-	-
		TG -26	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGS-37	-	-	-	-	-	-	-	-	-	-	-	✓
		GJG-17	-	-	-	✓	-	-	-	-	-	-	-	-
		GJG-22	-	-	-	-	✓	-	-	-	-	-	-	-
6	Orissa	Smruti (OG -52-1)	-	✓	✓	✓	✓	-	-	-	-	-	-	-
		TG -38B (TG -38)	-	-	-	✓	-	-	-	-	-	-	-	-
		Vasundhara (Dh-101)	-	-	-	✓	-	✓	-	-	✓	✓	-	-
		TG 51	-	-	-	✓	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
		Girmar-3 (PBS-12160)	-	-	-	-	-	-	-	-	-	✓	✓	-

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses (contd.)

S. No.	State	Variety	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	Drought
7	West Bengal	TG -38B (TG -38)	-	-	-	✓	-	-	-	-	-	-	-	-
		Vasundhara (Dh-101)	-	-	-	✓	-	✓	-	-	✓	✓	-	-
		TG -51	-	-	-	✓	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
		Girmar-3 (PBS-12160)	-	-	-	-	-	-	-	-	-	✓	✓	-
8	Rajasthan	RG -141	-	✓	-	-	-	✓	-	-	-	-	-	-
		GG-7 (J-38)	-	✓	-	-	-	-	-	-	-	-	-	-
		Somnath (TGS-1)	-	✓	-	-	-	-	-	-	-	-	-	-
		GG -14 (JSP-28)	-	-	-	-	-	-	-	-	✓	✓	✓	-
		Pratap Mungphali-2	-	-	-	-	-	-	-	-	✓	✓	✓	-
		Pratap Mungphali-1	-	-	-	-	-	-	-	-	✓	✓	✓	-
		Mukta (DRG -17)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		Durga (RG -382)	-	✓	✓	-	-	-	-	-	✓	✓	✓	-
		Ambar (CSMG-84-1)	-	✓	✓	-	-	-	-	-	-	-	-	-
		ICGS-1 (ICGV-87119)	-	✓	-	-	-	✓	-	-	-	-	-	✓
		Girnar-2 (PBS-24030)	-	✓	✓	-	-	✓	-	-	-	-	✓	-
		Utkarsh (CSMG-9510)	-	-	✓	-	-	-	-	-	-	-	-	-
		GG-21 (JSSP 15)	-	-	-	-	-	-	-	-	-	-	-	-
		HNG-69	✓			✓	✓	-	-	-	-	-	-	-
		Divya	-	-	-	-	-	✓	-	-	-	-	-	-

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses (contd.)

S. No.	State	Variety	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	Drought
9	Karnataka	Mankya (DRG-12)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		R-9251	-	-	-	-	-	✓	-	-	-	-	-	-
		Apporva (R-8808)	-	-	✓	-	-	✓	-	-	-	-	-	-
		Ajeya R-2001-3)	-		-	-	-	✓	-	-	-	-	-	-
		VRI (Gn)-6 (VG-9816)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGV-86325	-	-	✓	-	-	✓	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	✓	-	-	-	-	-	-
10	Uttar Pradesh	GG -14 (JSP-28)	-	-	-	-	-	-	-	-	✓	✓	✓	-
		Mukta (DRG -17)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGS-5 (ICGV-87121)	-	-	✓	-	-	-	-	-	-	-	-	✓
		Ambar (CSMG -84-1)	-	✓	✓	-	-	-	-	-	-	-	-	-
		ICGS 1 (ICGV-87119)	-	✓	-	-	-	✓	-	-	-	-	-	✓
		Girnar-2 (PBS-24030)	-	✓	✓	-	-	✓	-	-	-	✓	✓	-
		Utkarsh (CSMG-9510)	-	-	✓	-	-	-	-	-	-	-	-	-
		HNG -69	✓	-	-	✓	✓	-	-	-	-	-	-	-
		Divya	-	-	-	-	-	✓	-	-	-	-	-	-

Annexure IV. State-wise list of resistant or tolerant improved varieties for various biotic and abiotic stresses (contd.)

S. No.	State	Variety	Resistant/Tolerant of diseases							Resistant/Tolerant of Nematode/ Kalahasti-malady	Resistant/ Tolerant of insect pests			Tolerant of abiotic stresses
			ELS	LLS	Rust	Stem rot	Collar rot	PBND	<i>A. flavus</i>		<i>Spodoptera</i>	Thrips	Leaf miner	Drought
11	Punjab	M-522	✓	-	-	-	-	-	-	-	-	-	-	-
		SG -99	-	-	-	-	-	✓	-	-	-	-	-	-
		M-548	-	✓	-	-	✓	-	-	-	-	-	-	-
		GG -14 (JSP-28)	-	-	-	-	-	-	-	-	✓	✓	✓	-
		Mukta (DRG -17)	-	✓	✓	-	-	✓	-	-	-	-	-	-
		ICGS 5 (ICGV- 87121)	-	-	✓	-	-	-	-	-	-	-	-	-
		Ambar (CSMG - 84-1)	-	✓	✓	-	-	-	-	-	-	-	-	-
		ICGS 1 (ICGV 87119)	-	✓	-	-	-	✓	-	-	-	-	-	✓
		Girnar-2 (PBS-24030)	-	✓	✓	-	-	✓	-	-	-	✓	✓	-
		Utkarsh (CSMG- 9510)	-	-	✓	-	-	-	-	-	-	-	-	-
		HNG -69	✓	-	-	✓	✓	-	-	-	-	-	-	-
12	Madhya Pradesh	TG -26	-	✓	✓	-	-	✓	-	-	-	-	-	-
		Jawahar Groundnut-3 (JGN-3)	-	✓	✓	-	-	-	-	-	-	✓	✓	✓
		Jawahar Groundnut-23 (JGN-23)	✓	✓	-	-	-	-	-	-	-	-	-	✓
13	Bihar and Jharkhand	BG-3 (Birsa Groundnut-3)	✓	✓	-	-	-	-	-	-	-	-	-	✓
		TG-38B (TG-38)	-	-	-	✓	-	-	-	-	-	-	-	-
		Vasundhara (Dh-101)	-	-	-	✓	-	✓	-	-	✓	✓	-	-
		TG-51	-	-	-	✓	-	-	-	-	-	-	-	-
		Vijetha (R-2001-2)	-	-	-	-	-	-	-	-	✓	-	-	-