IOPEPC Kharif-2016 Crop Survey: Groundnut
Pre-final Estimates

Groundnut is a major oilseed and a supplementary food crop of India. With an all-season annual acreage of 55-60 lakh hectares, India ranks first in acreage and with a production of about 80 lakh tonnes, ranks second after China.

Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan and Tamil Nadu collectively accounted 87.62% of the national kharif-2016 acreage. Majority of groundnut farmers belong to marginal and small land holding category. In low average rainfall areas, the farmers having no access to supplementary irrigation, raise the crop with minimal inputs.

The extent and distribution of rainfall greatly influences the productivity. Optimally, the crop needs 700-800 mm rainfall and 25-35°C temperature. It can easily withstand a higher rainfall in sandy soils or otherwise well-drained fields. For pre-sowing, sowing and post-sowing germination period about 175-200 mm rain fall is sufficient. Subsequently an evenly distributed rainfall of 500-600 mm across the vegetative and reproductive phases leads to good productivity. Unseasonal rains at the time of harvest interfere with the harvesting operations and post-harvest curing and drying of pods even as the terminal drought lowers the productivity and also results in harvesting losses as a greater proportion of pods are left behind below the soil surface while uprooting the plants. A post-harvest dry-spell is desirable for proper drying (curing) of pods attached to the uprooted plants being dried in windrows in the open fields. Besides, the groundnut crop is susceptible to several diseases and insect pests. In kharif-2016, the crop was sown on 47,07,500 hectares in India– an expansion 24.1% over kharif-2015 acreage (37,92,900 hectares).

Methodology

A survey was organised with the partnership of state agricultural universities. Using a pre-set questionnaire, 4256 farmers were interviewed at their respective farms/villages.

State	Acreage (hectare)	Farmers interviewed	Partner Agricultural University
Andhra Pradesh	9,23,405	1094	ANGRAU, Guntur, A.P.
Gujarat	16,30,000	1329	JAU, Junagadh, Gujarat
Karnataka	5,27,417	528	UAS, Dharwad, Karnataka
Maharashtra	2,10,370	431	MPKV, Rahuri, Maharashtra
Rajasthan	6,16,629	614	SKRAU, Bikaner, Rajasthan
Tamil Nadu	2,17,036	260	TNAU, Coimbatore, Tamil Nadu

The figures for district and state acreage have been obtained from the respective state government. On the basis of survey, average yields of the selected districts have been estimated. The average yield of the non-surveyed districts has been considered to be equal to that of weighted average yield of the surveyed districts in the respective state. The state wise and all India figures for the pre-final estimates of production of in-shell groundnut are given here. **The figures given for acreage, yield and production in the tables have been**

rounded off to whole numbers. Hence the figures arrived at by back calculations may often differ a little from those shown in the tables.

1. Andhra Pradesh

In Andhra Pradesh groundnut covered an area of 9,23,405 hectares in kharif-2016 showing an expansion by 35.4% over the kharif-2015 acreage (6,82,000 hectares). The sowing operations began as early as the second fortnight of May and stretched up to first fortnight of August. The bulk of the sowing, however, was from 1st week of June to the 2nd week of July. The harvesting began from 1st week of September to 1st week of November with the bulk being harvested during entire October.

The recommended variety 'Kadiri-6', a Spanish type, has been found to be the most popular (80%) among the farmers interviewed and another Spanish variety 'Narayani', was found to be the second most popular (7%). 'JL 24', 'TMV 2', 'TAG 24', 'Kadiri 9', and 'Kadiri Haritandhra'- are the other Spanish types sown by the farmers.

Estimated yield and production of groundnut (in-shell)

	District	Share in acreage (%)	Farmers contacted	Rainfall* (mm)	Acreage** (ha)	Yield (kg/ha)	Production (MT)
1	Anantapuramu	65.99	682	510	609377	224	136500
2	Chittoor	14.28	232	762	131855	595	78454
3	Kurnool	12.53	100	604	115673	1044	120763
4	YSR Kadapa	4.58	80	580	42277	996	42108
	Sub-total	97.38	1094	-	899182	-	377825
	Others	2.62		-	24223	-	10005
	All AP	100	1094	-	923405	420	387830

*Total rainfall during 01.06.2016 to 31.10.16; source: CREAMS, IARI, New Delhi
**As reported on 07.09.2016; source: Government of Andhra Pradesh

General comments:

The estimated yield (224 kg/ha) of Ananatpuramu having the largest acreage in the state is quite low and much below the estimated state average yield (420 kg/ha). Apparently, in kharif-2016, this district had a moderate total rainfall of 510 mm. An analysis of rainfall data of this district, however, reveals that out of a total rainfall of 510 mm, as much as 364 mm (71.4%) was received in the pre-sowing, sowing, and post-sowing germination/early vegetative phase (1st June to 31st July 2016) while only 164 mm (28.6%) was received during the rest of the season which is grossly inadequate. This resulted in a poor conversion of flowers into effective pegs and subsequent pod development.

An analysis of rainfall data from the other three districts viz., Chittoor, Kurnool and YSR Kadappa indicates that up to July 31 there was 544, 364 and 405 mm rainfall, respectively while the post July rainfall was grossly inadequate i.e. only 218, 240 and 175 mm, respectively. Although in the other three districts the post July

rainfall was slightly better than that in Ananatpuramu yet it was much less than needed. Furthermore, there was no rainfall after the 10th of October which severely hit the late sown crop. This explains realization of low yields in Andhra Pradesh.

2. Gujarat

Compared to kharif-2015 (13,55,000 hectares), the acreage in kharif-2016 expanded by 20.3% (16,30,000 hectares). The time window for sowing was narrow. The bulk of the sowing, was done from last week of June to the 2nd week of July and the bulk of the crop was harvested during October.

'GG-20', a semi-spreading variety (released in 1992) continues to be the most popular variety in the state. Among the Spanish types, a very old variety 'GG 2' (released in 1982) and a relatively new large seeded variety 'TLG-45' (released in 2007) have been found popular. Most farmers have used their home grown seed whereas a good number have obtained seeds from private companies and oil-mills. The district wise estimated yield and production are given below.

Estimated yield and production of groundnut (in-shell)

	Districts	Share in acreage (%)	Farmers interviewed (no.)	Rain fall* (mm)	Acreage** (ha)	Yield (kg/ha)	Production (MT)
1	Rajkot	16.75	275	585	273100	1680	458808
2	Junagadh	15.57	247	959	253800	2052	520798
3	Dwarka	10.82	129	618	176300	1627	286840
4	Amreli	8.71	130	711	141900	2200	312180
5	Jamnagar	8.07	129	732	131600	1856	244250
6	Gir-Somnath	7.34	121	996	119600	2413	288595
7	Banaskantha	7.15	120	466	116600	1898	221307
8	Bhavnagar	6.71	108	647	109300	1758	192149
9	Kutch	2.74	70	307	44700	2234	99860
	Sub-total	83.86	1329		1366900	-	2624786
	Others	16.14	-	-	263100	-	505152
	All Gujarat	100	1329	-	1630000	1920	3129938

*Rainfall up to 19.10.16; source: Gujarat State Disaster Management Authority, Government of Gujarat.

**As reported on 06.09.2016; source: Government of Gujarat

General comments

A high average state yield could be attributed to the use of semi-spreading variety 'GG-20' coupled with optimal rainfall both in terms of quantum as well as distribution across the season.

The variety 'GG-20' being a long-duration type responds to a slightly higher rainfall.

In low rainfall areas, high productivity could be attributed to supplementary irrigation.

Most farmers apply recommended doses of fertilizers and gypsum.

Out of 1329 farmers interviewed, 263 have used micro-irrigation systems.

There was no report of widespread occurrence of any insect pest or disease. Sporadic occurrence of white grub (*Holotrichia consanguinea*), a polyphagus pest,

however, has been reported in Saurashtra region. A strategy is required to check the incidence of this pest in groundnut fields in the years to come.

3. Karnataka

In this state, the acreage of groundnut in kharif-2016 (5,27,417 hectares) expanded by 28.6% compared to that of kharif-2015 (4,10,000 hectares).

The bulk of the sowing was done from the 2nd week of June to the 3rd week of June and the bulk of the crop was harvested from 2nd to last week of October.

Amongst the farmers interviewed, 70% had used the old Spanish variety 'TMV-2' and among the new varieties, 'GPBD-4' had gained considerable ground. Most farmers used their home grown seed while a good number obtained seeds from the private companies and oil-mills.

Estimated yield and production of groundnut (in-shell)

	District	Share in acreage (%)	Farmers Interviewed (no.)	Rainfall (mm)	Acreage* (ha)	Yield (kg/ha)	Production (MT)
1	**Chitradurga**	25.33	129	582	133597	200	26719
2	**Tumakuru**	17.41	90	753	91803	466	42780
3	**Bellari**	9.47	75	692	49927	708	35348
4	**Gadag**	8.13	36	764	42861	601	25759
5	**Dharwad**	6.29	50	914	33183	1158	38426
6	**Chikkaballapur**	5.61	30	673	29565	162	4790
7	**Belagavi**	4.97	33	952	26229	1442	37822
8	**Vijaypura**	4.82	30	894	25432	626	15920
9	**Haveri**	4.15	34	829	21887	2118	46357
10	**Davanagere**	2.67	21	716	14101	1610	22703
	Sub-total	88.85	-	-	468585	-	296624
	Others	11.15	-	-	58832	-	37231
	All Karnataka	100	528	-	527417	633	333855

*Total rainfall during 01.06.2016 to 31.10.16; source: CREAMS, IARI, New Delhi
**As reported on 24.09.2016; source: Government of Karnataka

General comments

In most of the groundnut growing districts of Karnataka, the quantum of rainfall up to July 31 was quite excessive. However, during the post-July period it was lowest in Chikaballapur (170 mm) which incidentally recorded the lowest estimated yield (162 kg/ha). Likewise in Chitradurga, the post-July rainfall was only 200 mm and the estimated yield is also low. Therefore, owing to very low yields in these two districts which together account for 31.94% of the state acreage, the state average yield has come down.

Although the estimated yield in Haveri is quite high (more than three times that of the state average) it could be attributed among other factors to integrated micro irrigation scheme launched way back in Haveri besides a 270 mm rainfall during post July period.

Therefore the following factors appear to have caused a low realization of yield potential in the state:

i) Use of old and short duration Spanish varieties

ii) Minimal inputs of fertilizers and agrochemicals
iii) Excessive rainfall up to 31st July and very low post-July rainfall resulting in a semi-drought like situation.

4. Maharashtra

In kahrif-2016, there was an expansion of acreage by 13.1%. The kharif-2016 acreage was 2,10,370 hectares compared to 1,86,000 hectares in kharif-2015.

Most of the sowing was done during the first fortnight of July and the crop was harvested from the last week of October to first week of November.

'SB XI', one of the oldest Spanish variety of India (released in 1965) continues to be very popular among the farmers while another relatively new Spanish variety 'TAG 24' (released in 1992), has gained considerable ground. Most farmers dispose off their produce shortly after harvest and procure seed for the next season from the local seed traders. Thus seed supply is maintained through an informal (non-official) seed chain.

Estimated yield and production of groundnut (in-shell)

	District	Share in acreage (%)	Farmers Interviewed (no.)	Rainfall (mm)	Acreage* (ha)	Yield (kg/ha)	Production (MT)
1	Kolhapur	22.95	94	1380	48284	1109	53547
2	Sangli	13.98	62	1146	29420	863	25389
3	Satara	13.71	65	1545	28833	1519	43797
4	Nashik	12.32	65	1091	25911	1777	46044
5	Pune	7.90	35	1339	16619	1423	23649
6	Dhule	7.84	60	1082	16484	1548	25517
7	Aurangabad	3.97	25	1039	8344	1190	9929
8	Ahmednagar	3.96	25	1124	8332	1580	13165
	Sub-total	86.63	-	-	182227	-	241037
	Others	13.37	-	-	28143	-	37283
	All Maharashtra	100	431	-	210370	1323	278320

*Total rainfall during 01.06.2016 to 31.10.16; source: CREAMS, IARI, New Delhi
**As reported on 03.09.2016; source: Government of Maharashtra

General comments

The rainfall in most of the groundnut growing districts was more than that required by the crop and the realization of yield was accordingly an all-time high. In Kolhapur (total rainfall 1380 mm) there was a semi-drought like situation for about 30 days as there was only 77 mm rainfall from 5th August to 13th September. More or less similar dry spells were there in Sangli, Satara, Nashik, Ahmednagar and Pune.

Although application of gypsum is recommended, rarely do the farmers apply it. Many farmers have reported application of commercial micronutrient mixtures.

Considering the productivity of groundnut in the previous kharif seasons, kharif-2016, with an estimated yield of 1323 kg/ha, appears to be one of the best years for groundnut farmers of Maharashtra where yield generally remains in the range of 850-1100 kg/ha.

5. Rajasthan

Compared to 5,16,900 hectares in kharif-2015, the kharif-2016 acreage was 6,16,629 hectares which indicates not only an expansion by 19.3% but the highest ever acreage of kharif groundnut in Rajasthan. Most of groundnut area in the state has ideal soils (sandy, sandy-loam and alluvial) for this crop.

In kharif-2016, the major area was sown from June 1st week to July 2nd week and harvested from October 3rd week to November 2nd week.

Semi-spreading variety 'GG-20' has become quite popular in this state and its seed is marketed under various variant names. Sapnish variety of Rajasthan 'HNG-10' has covered a sizeable area.

Estimated yield and production of groundnut (in-shell)

	District	Share in acreage (%)	Farmers contacted	Rainfall* (mm)	Acreage* (ha)	Yield (kg/ha)	Production (MT)
1	Bikaner	31.73	194	413	195626	3258	637350
2	Jodhpur	17.46	121	593	107642	1544	166199
3	Churu	8.46	51	518	52141	2973	155015
4	Jaipur	6.57	62	916	40526	2752	111528
5	Hanumangarh	5.43	48	467	33500	2071	69379
6	Dausa	3.78	29	1163	23315	1476	34413
7	Sikar	3.28	18	908	20204	2761	55783
8	Nagaur	2.16	26	926	13324	2258	30086
9	Tonk	1.89	65	1163	11647	1562	18193
	Sub total	80.76	-	-	497925	-	1277946
	Others	19.24	-	-	118704	-	304941
	All Rajasthan	100	614	-	616629	2567	1582887

*Total rainfall during 01.06.2016 to 31.10.16; source: CREAMS, IARI, New Delhi
**As reported on 22.09.2016; source: Government of Rajasthan

The realization of high-productivity in kharif-2016 could be attributed to:

- Pre-monsoon sowing of long-duration varieties by farmers having groundwater resources.
- Near optimal and evenly distributed rain fall across the crop season.
- More than three-fourths acreage having ground water for providing supplementary irrigation using sprinklers.
- Application of organic manure and the recommended doses of fertilizers along with application of gypsum.
- Adoption of the recommended seed rate for having optimum plant population.
- Adoption of prophylactic measures for managing insect pests and diseases

6. Tamil Nadu

The acreage of kharif groundnut in Tamil Nadu has been stable for the last five years. In Kharif-2016 (2,17,036 hectares) there was a nominal increase (2.7%) in acreage compared to that of kharif-2015 (2,11,400 hectares).

The age old Spanish variety 'TMV-2' (released in 1940) continues to be the most prevalent and its seed supply is maintained through an informal (non-official) seed chain with several local variant names.

As usual for kharif season in this state, the bulk of the planting lasted for about a month from the 3rd week of June to the 3rd week of July and the harvesting was done from October 1st week to November 2nd week.

Estimated yield and production of groundnut (in-shell)

	District	Share in acreage (%)	Farmers interviewed (no.)	Rainfall (mm)	Acreage* (ha)	Yield (kg/ha)	Production (MT)
1	Thiruvannamalai	27.48	75	824	59647	605	36086
2	Vellore	14.25	40	891	30928	814	25175
3	Namakkal	12.22	33	673	26531	756	20057
4	Villupuram	8.20	22	732	17787	568	10103
5	Salem	6.72	18	755	14584	766	11171
6	Erode	6.69	18	565	14525	679	9862
7	Krishnagiri	5.85	32	733	12701	720	9145
8	Dharmapuri	3.57	22		7751	602	4666
	Sub-total	84.99	-	-	184454	-	126265
	Others	15.01	-	-	32582	-	22405
	All Tamil Nadu	100	260	-	217036	685	148670

*Total rainfall during 01.06.2016 to 31.10.16; source: CREAMS, IARI, New Delhi
**As reported on 31.08.2016; source: Government of Tamil Nadu

General comments

Among the major groundnut growing states, Tamil Nadu holds the record of having consistently high productivity. However, in kharif-2016 season the crop received a setback owing to erratic distribution of rainfall.

In Thiruvannamalai district (largest acreage in the state) the total rainfall was 824 mm but as much as 517 mm was received up to July 31 and only 307 mm was received during the post-July period. Likewise in Vellore (the second largest acreage in the state) the rainfall up to July 31 was excessive (596 mm) while it was low (295 mm) during the post-July period. For realizing a good yield a rainfall of at least 450-600 mm is required during the post July period. This season, a low rainfall in post-July period created a drought like situation resulting in a poor conversion of pegs into pods.

Moreover, since there was no rainfall after 12th October, the farmers were constrained to harvest the crop from dry and hard soils and while uprooting the plants a good number of pods were left behind in the fields below the soil surface. Thus the average state yield which used be stable around 2000 kg/ha has come down to as low as 685 kg/ha.

7. All India

Compared to kharif-2015 (37,92,900 hectares), the groundnut acreage in kharif-2016 expanded by 24.11% (47,07,500). A considerable expansion of acreage has been recorded in Andhra Pradesh (35.4%), Karnataka (28.6%), Gujarat (20.3), Rajasthan (19.3%) and also to some extent in Maharashtra (13.1%) and a nominal expansion in Tamil Nadu (2.67%) while there was an expansion by 35.0% in other states put together.

In most states the planting and harvesting operations were completed nearly in time. The heavy initial rainfalls in many districts of the southern states, however, did inturrupt the sowing operations and the sowing window streched by 7-9 days.

In all the three southern states, the rainfall was uneven as 50-70% rainfall was received by 31st July which lead to a subsequent drought-like situation in many districts. Maharashtra could reap a good harvest as the post July rains were not very deficient. Gujarat could reap a good harvest as the rainfall pattern was in conformity with the crop requirements. Rajasthan crop, equipped with need based supplementary irrigation facilities, performed exceedingly well.

Except for Andhra Pradesh, old varieties appeared to be popular among the farmers. Most farmers used either their homegrown seeds or that obtained from local traders/oil-mills. Therefore authentic seed replacement rate of the prevalent or the recommended varieties appears to be much lower than desirable.

Since there were no rains after 10th-12th October, the harvesting operations could be completed in time in all the states. However, there were harvesting losses of varying degree in the fields wherein the plants were uprooted from dry and hard soils as a result a greater number of pods were left behind under the soil surface. The post-harvest drying of produce also went very well as nowhere it was caught in the unseasonal rains. The pre-final statewise and all India estimates are given below.

Estimated yield and production of groundnut (in-shell)

State	Share in acreage (%)	Farmers interviewed (no.)	Acreage (ha)	Yield (kg/ha)	Production (MT)	Share (%)
Andhra Pradesh	19.62	1094	923405	420	387830	5.80
Gujarat	34.63	1329	1630000	1920	3129938	46.79
Karnataka	11.20	528	527417	633	333855	4.99
Maharashtra	4.47	431	210370	1323	278320	4.16
Rajasthan	13.10	614	616629	2567	1582887	23.66
Tamil Nadu	4.61	260	217036	685	148670	2.22
Sub-total	87.62	-	4124857	-	5861500	87.62
Others	12.38	-	582643	-	827858	12.38
All India	100	4256	4707500	1421	6689358	100

Thus with an acreage of 47,07,500 hectares and an estimated average productivity of 1,421 kg/ha; a production of 66,89,358 MT in-shell groundnut is anticipated from kharif-2016 season.