

**ICAR-All India Coordinated Research Project
on Chickpea**

Indian Council of Agricultural Research

Project Coordinator's Report

(2021-22)

by

Dr. G.P. Dixit

ANNUAL GROUP MEET ON CHICKPEA

17th – 18th August, 2022



**All India Coordinated Research Project on Chickpea
ICAR-Indian Institute of Pulses Research
Kanpur 208 024**

Correct Citation : Project Coordinator's Report 2021-22
All India Co-ordinated Research Project on Chickpea
ICAR-Indian Institute of Pulses Research
Kanpur- 208 024

INTRODUCTION

Pulses constitute an important component of various cropping sequences followed across the country with region specific variations in preferences and suitability to agro production situation. Endowed with the virtues of efficient utilization of available limited soil moisture and nutrients as well as producing beneficial impact on physical and chemical properties of soil, pulses are basic for sustainable crop production system. These crops not only fix the atmospheric nitrogen for their growth and thereby reducing the dependence on external nitrogen source, but also contribute towards increasing the availability of nitrogen for subsequent crop. Pulses are known for being super food with double the protein in wheat and rice. Besides, they are also rich in complex carbohydrates, micronutrients, protein and B-vitamins and minerals like folate, iron, calcium, magnesium, zinc and potassium. Being rich in fibre and low in fat, pulses are good for managing cholesterol, digestive health and regulating energy levels and thus contribute to human health. Long shelf life without loss of nutritional value, low prices coupled with wide availability make pulses an affordable source of protein and minerals and contribute to food security at all levels specially a large proportion of rural populations. They are considered as 'protein for the poor' in the world.

Amongst pulses, chickpea is the major crop with share of about 49% of the total pulses being produced in India. The crop is grown in almost every part of the country with an increasing trend in production and productivity in the recent years. In India, chickpea research started with the establishment of the All India Coordinated Pulses Improvement Project (AICPIP) in 1967. Research activities systematically carried out in the disciplines of Plant Breeding, Agronomy, Plant Pathology, Entomology and Microbiology helped in development of high yielding chickpea varieties and matching production and protection technologies for different agro-ecological zones. At present, AICRP on Chickpea has 28 centres under 27 Agricultural Universities in the country to serve the R&D needs of the chickpea growers of different agro-climatic zones. Major activities of various centres include the development of improved varieties suitable for respective regions, development of location-specific technologies on crop production and crop protection besides, production of breeder seeds of high yielding varieties. Frontline demonstrations on improved technologies are successfully organized for effective and speedy dissemination of newer technologies to the chickpea growers for enhanced productivity and optimal input usage.

INDIAN CHICKPEA SCENARIO

Chickpea has played a major role in realization of Pulse Revolution in India making the country near self-sufficient in pulses. There has been remarkable increase in chickpea production and productivity in the country during 2014-15 to 2021-22. From a level of 7.33 million tonnes in 2014-15, chickpea production rose to an all-time high of 13.98 million tonnes during 2021-22. This represented an increase of nearly 91% during last eight years. Similarly, there is an increase of more than 34% in chickpea productivity during the period. This increase can be attributed to technological advancements, increased availability of quality seed, better inter-institutional and international collaboration and dedicated policy support.

Madhya Pradesh, Rajasthan, Maharashtra, Gujarat, Uttar Pradesh, Andhra Pradesh, Karnataka, Chhattisgarh, Bihar and Jharkhand contribute more than 95% to the total chickpea

production in the country. In India, both *desi* and *kabuli* type chickpea varieties are grown. India is the largest producer of chickpea with more than 2/3rd share in area and production of chickpea in the world. India continued to remain a major importer of *desi* chickpea, but has emerged as a major exporter of *kabuli* chickpea during the past decade. India has made remarkable progress in expanding chickpea area and production. The area in central and southern states has increased by about 4 million ha in the past 20 years. This helped India in largely compensating the loss in chickpea area that earlier occurred in northern India due to expansion of irrigated wheat cultivation.

More than 250 chickpea varieties have been developed in India till date with higher yield potential, reduced crop duration, large seeded *kabuli* (>50g/100 seeds), incorporation of biotic and abiotic stress resistance, amenability to machine harvesting etc. Besides, molecular marker based advanced technologies have been integrated for fast-tracking release of chickpea varieties. Chickpea varieties have been evolved for biotic and abiotic stress tolerance using marker assisted back-crossing (MABC). A few mega varieties of chickpea developed in the past are still popular among the farmers despite becoming susceptible to different stresses. Efforts have been made to improve such varieties through marker assisted backcrossing (MABC). These efforts have led to the development of three chickpea variety having tolerance to drought and three varieties for resistance to fusarium wilt. These varieties with high yield performance and enhanced resistance to biotic and abiotic stresses demonstrate the potential of integrating genomics with breeding efforts to develop superior climate resilient varieties in chickpea.

Seed is the most critical input as far as productivity of chickpea is concerned. To ensure quality seed availability in the country, 8656.83 q of chickpea breeder seed based on DAC indent has been produced during 2021-22. Besides, additional breeder seed under Enhanced Breeder Seed Production programme and quality seed (foundation and certified seed) under Seed Hub project has been produced. This has led to increase in seed replacement rate in chickpea from less than 10% in 2005 to nearly 30% in recent years. Besides, the share of new varieties (<10 years old) has increased to more than 81%.

WEATHER AND CROP

In NWPZ, the seasonal rainfall varied from 28 mm (Samba, Durgapura and Hisar) to 157.7 mm (Ludhiana) and the total number of rainy days varied from 6 to 10 days. In NEPZ, rainfall received during crop season ranged from 112.2 mm (4 rainy days) at Dholi to 423.3 mm at Imphal in Assam (48 rainy days). In Central Zone, the rainfall received at different centers was from 131.0 mm at Kota to 1227.5 mm at Junagarh. In South zone, 1169.9 mm rainfall received at Kalaburagi in Karnataka and 119.8 mm at Nandyal during the crop season. In general, least rainfall received in NEPZ followed by CZ and NEPZ, whereas maximum in SZ.

Physical and chemical characteristics of soil at different AICRP network locations revealed that under NWPZ, the soil texture varied from loamy sand or sandy loam (Ludhiana, Samba, Hisar, Durgapura and Sriganaganagar) to clay loam (Pantnagar) with the pH range of 6.50 to 7.95. Soil organic carbon (SOC) status was usually low with occasionally high (1.18% at Pantnagar); and P and K status were medium to high. In NEPZ, the soil was sandy loam to clay loam (at Imphal, Ranchi and Kalyani) with a pH range of 5.60-8.20. Here, SOC was observed to be as low as 0.20 (Dholi in Bihar) to 1.68% (Imphal in Manipur); and the soil P and K content were mostly of

medium category. In Central Zone, the experimental sites have heavy soils (clay to clay loam) with a pH range of 7.10 (Raipur) to 8.30 (Akola); and SOC was low to medium. The soil P and K content varied from medium to high. In Southern Zone at Kalaburagi and Nandyal, deep black soil with medium fertility was evident.

RESEARCH THRUSTS

Although there has been overall growth in chickpea production in the country in recent years, we should be wary of different challenges posed by changing climate, emerging diseases and pest pressure, new demands in western countries for vegetarian protein and competition with other rabi crops especially irrigated wheat, sorghum, few commercial crops etc. Accordingly, chickpea researchers have to remain prepared with a wide range of genotypes which may adapt themselves across changing climates. For developing such genotypes, wild relatives which are rich reservoir of useful alien genes can play an important role. Further improvement in the productivity is needed through conservation and diversification of agriculture so as to increase the productivity of the system and improve soil health. Climate change associated with temperature rise and water scarcity adversely affecting the productivity, particularly under rainfed pulse growing regions, is one of the major challenges which need to be addressed on priority.

Chickpea in India is cultivated in nearly 25 states with varied agro-climate. Each region poses different challenges. In North India the crop suffers from excessive foliage growth, lodging, poor yields, remains non-competitive, non-responsive to inputs; the north east region has acidic soil where chickpea do not perform well while the rice fallow provides a completely different challenge. The crop in central and south India suffers from abiotic stresses like heat and drought and biotic stresses like dry root rot, wilt etc. Fusarium wilt and gram pod borer affects the crop in entire country and may cause complete crop loss under favourable conditions.

To tackle all these problems, the research strategies that need immediate focus are as follows:

- a. **High input responsive & lodging resistant varieties:** Excessive vegetative growth due to irrigations and/or rains during the crop season is a major problem of the existing chickpea varieties in northern India because of the cooler long growing season and heavy soils which often receive high dose of nitrogen in cereal crops. The excessive vegetative growth of chickpea leads to poor harvest index, lodging, and reduction in grain yield and quality. Thus, northern India requires chickpea varieties which respond favourably to high fertility and irrigated conditions and resist excessive vegetative growth and lodging. The plant type for such growing conditions of northern India should include semi-erect and compact growth habit and high harvest index. It should respond to irrigation and high plant density conditions and should not lodge. Efforts are being made to develop genotypes with short internodes and erect growth habit as such plant type may resist excessive vegetative growth in high input conditions.
- b. **Broadening the genetic base:** There is a growing concern on limited genetic diversity due to frequent use of limited germplasm in breeding improved varieties. Genetic enhancement through pre-breeding is proposed for increasing the extent of useful diversity available to breeders through introgression of desirable characteristics from exotic material and wild

species. Wild *Cicer* species are known to have traits which help these species to survive in challenging environments. With rapid generation advancement and recent successes and availability of new biotechnology tools have brightened the prospects of transferring useful traits from exotic materials as well as primary and tertiary gene pools in chickpea. The genes from *C. reticulatum*, *C. judaicum*, *C. echinospermum* have been introgressed to chickpea (*C. arietinum*). Research centres like IIPR Kanpur, IARI New Delhi and PAU Ludhiana are actively involved in prebreeding programme involving wild accessions of *C. reticulatum*, *C. pinnatifidum*, *C. judaicum*, *C. echinospermum*. Some of the derivatives of interspecific crosses are under testing at national level for yield and resistance against major diseases of chickpea and a variety PBG 8 has been recently released for Punjab state.

- c. **Short duration varieties:** One of the most important achievements of research efforts in chickpea has been substantial reduction in duration of improved varieties. This has increased the per day productivity of chickpea comparable to any rainfed crops including rainfed rice and wheat besides making them suitable for introduction in new niches and diversification of the existing cropping systems. There is ample scope for expanding area under this crop in the rice-fallows available in eastern India (Jharkhand, Bihar, Chhattisgarh, Odisha and West Bengal). The most important traits required are early growth vigor, rapid biomass accumulation (tolerance to cold temperature at vegetative stage), early to extra-early maturity, and tolerance to end of the season high temperature stress.
- d. **Machine harvestable and herbicide tolerant varieties:** Reduced cost of cultivation and minimize losses due to weeds has become one of the major objectives for chickpea improvement throughout world. The farmers of India are gradually enhancing mechanization of farm operations for improving efficiency and reducing cost of cultivation. The farmers are demanding chickpea cultivars which can be directly harvested by combine harvesters. Most of the present-day chickpea cultivars are not suited to machine harvesting because the plant height and plant architecture is not suitable for mechanized harvesting. Efforts have been made to alter the crop phenology by developing semi-erect plant types with bearing pods about 25-30 cm above ground surface to facilitate machine harvesting. This has led to development of many chickpea varieties with upright growth habit amenable to machine harvesting. Four such varieties namely Phule Vikram (Phule G 08108), Pusa Parvati (BG 3062), JG 2016-24 and RVG 204 have been recently developed for cultivation in Central India. Besides few other varieties have also been developed for cultivation in states like NBeG 47 (Andhra Pradesh) and GBM 2 (Karnataka). These varieties will not only help in minimizing cost of cultivation and losses due to quick harvest but also reduce human drudgery. Another trait that can save labour and production cost is identification of plant resistance against post emergence herbicides (PEH). Chickpea is very much sensitive to application of herbicides at different growth stages and manual weeding is the only option left in hands of farmers for weed control which is labour intensive hence expensive. Therefore, development of post emergence herbicide tolerant chickpea varieties is the need of the day as it can economically facilitate chickpea cultivation under resource conservation agriculture.
- e. **Extra-large seeded kabuli varieties:** Extra-large seeded *kabuli* are highly susceptible to frost injury in north India. Focus on adding frost/cold tolerance in *kabuli* chickpea for realizing

higher yield with large seed size is important. Since *kabuli* types with large seeds provide premium price to farmers, developing extra-large seeded types for north India will be a profitable venture for farmers. Efforts are further required on development of high yielding and better plant type with enhanced level of resistance to fusarium wilt and dry root rot.

- f. *Tapping Rice Fallows:*** The rice fallows provide an opportunity for increasing chickpea area, it poses unique challenges with acidic soil, excess moisture during sowing, poor germination, relatively higher temperature during growing period, abundance of collar rot, BGM and terminal drought stress. Although chickpea is not ideally suited to this condition, a large area in the region is available which provides a growing window to the crop. For this purpose, development of extra early or early maturing varieties of chickpea with resistance to Botrytis Gray Mould (BGM), collar rot, amenable to late planting and responsive to high input are required.
- g. *Mitigating Drought and Heat Tolerance:*** Drought and heat are the two most important abiotic stresses to chickpea production. About two-thirds of the chickpea area in India is rainfed where the crop often experiences moisture stress towards end of the crop season (terminal drought). Chickpea being a cool season food legume suffers heavy yield losses when exposed to heat stress ($>32^{\circ}\text{C}$) at reproductive (flowering and podding) stage. Heat stress is increasingly becoming a serious constraint to chickpea productivity because of large shift in chickpea area from cooler long-season environments to warmer short-season environments, increasing chickpea area under late sown conditions due to increasing cropping intensity, and high fluctuations in temperatures due to climate change. In the recent years, attempts have been made to transfer drought tolerance QTL's in selected background for developing improved varieties, however, there is need to mainstream it in all the cultivars as the crop is mainly grown as rainfed crop.
- h. *Utilizing genomic resources for biotic stress management:*** Among diseases, wilt is a perpetual problem and dry root rot is increasing exponentially in central and south India. Recently, chickpea varieties with multiple race resistance against FW from donor parent WR 315 has been developed using MABC approach. MAS for multiple race resistance need to be incorporated in chickpea breeding activities in the country. At present no highly resistant and stable source of dry root rot is available in cultivated chickpea. Similarly, for BGM, rust and collar rot, no stable source of resistant is available in cultivated types. There is need to develop stable and multiple disease resistant sources.
- i. *Utilizing germplasm for novel genes:*** The genetic variability available in the germplasm, particularly in wild species, should be exploited for broadening the genetic base of varieties and introgressing useful traits, such as resistance to insect-pests and diseases. Dedicated efforts are needed to access genes from these species. Novel breeding approaches, such as multi-parent advanced generation inter-cross (MAGIC), can be used for enhancing genetic recombination and combining favorable genes for tolerance to abiotic stresses and other desired traits. Rapid generation advancement (RGA) by taking two or more crop generations per year is must for reducing number of years required to develop a variety. High-throughput precision phenotyping protocols need to be developed and used for screening of germplasm and breeding materials for different traits related to stress tolerance and nutritional quality.

- j. **Pod borer management:** Pod borer (*Helicoverpa armigera*) continued to remain a major and challenging insect-pest of chickpea. It has been not possible to develop varieties with high levels of resistance to pod borer due to non-availability of sources with high levels of resistance in germplasm. Studies revealed considerable differences in the level of susceptibility of different chickpea lines against pod-borer. The multi-location trials have demonstrated reduced loss through biorationals, botanicals, bioagents, use of dust formulations, spray formulation in pest control demonstration trails. The refinement and the use of these components will further economize the cost of production and reduce the environmental pollution.
- k. **Nutritionally enhanced varieties:** Genetic variations for seed protein content, Fe and Zn has opened an avenue to enhance quality in chickpea. The protein content of currently available chickpea varieties ranges between 18-22% whereas germplasm lines (T39-1, A1-1) with high total protein content (>28%) in grains have been identified. These genotypes can be exploited for development of high protein varieties. Further, studies conducted so far on assessing genetic variability for nutritional quality traits in chickpea germplasm suggest large genetic variation for Fe (35-150 ppm) and Zn (25-50 ppm) and opportunity for developing varieties with enhanced contents of protein, iron and zinc.

MAJOR RESEARCH ACCOMPLISHMENTS (2021-22)

CROP IMPROVEMENT

Chickpea breeding efforts in the past have largely focused on breeding for high yielding, multiple disease resistant varieties of desi type and development of large seeded varieties of *kabuli* chickpea. From time to time, specific trial was constituted to meet the specific target needs such as large seeded desi and *kabuli* types, extra-large seeded *kabuli* types, adaptation to late sown condition, high input responsiveness and salt tolerance, resistance to *Fusarium* wilt and *Ascochyta* blight. The concerted efforts have led to the development of varieties such as JG 11, Vijay, Digvijay, KWR 108, Alok, HC 1, HC 5, Pusa 391, Pusa 372, BGM 547, Pusa 362, JG 16, JG 322, JG 130, RSG 963, Anvita, JG 14, JSC 55 and JSC 56, Pant G 186, Rajas, JAKI 9218, Vaibhav, BGD 78, Gujarat Gram 1, Gujarat Gram 2, GNG 1581 against wilt and root rot; GNG 469, Himachal Chana 1 and PBG 5 against *Ascochyta* blight; lodging tolerant DCP 92-3 for high input management condition; RSG 888, JG 74 and SCS 3 (IPC97-67) for drought prone areas; salt tolerant CSG 8962 (Karnal Chana 1), heat tolerant JG 14; large seeded *kabuli* varieties Pusa 1003, Pusa 1053, L551, L555, Vihar, JGK 1, KAK 2, Shubhra, Ujjawal, HK 05-169. In the recent past, extra-large seeded (>50 g per 100 seed weight) *kabuli* chickpea varieties such as JGK 5, MNK 1, PKV *kabuli* 4-1 and Phule G0517 were developed. As a result, an impressive growth in area, production and productivity of chickpea in India was realized during the past decade.

The major achievements of crop improvement programme for 2021-22 are listed below:

Varieties released and notified during 2021-22

Nandyal Gram 857 (NBeG 857): The desi chickpea variety developed from the cross ICCV 12419 × JG 11, is suitable for cultivation under timely sown irrigation condition in south zone. It has

medium bold brown attractive seed size of 23.4 g/100 seed. It has an average yield of 18-19 q/ha and matures in 95-100 days. The variety has been released for cultivation in south zone comprising of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu.

CG Akshay Chana (RG 2016-134): The desi chickpea variety developed from the cross ICCV 03112 x ICCV 10, is suitable for cultivation under timely sown irrigation condition in south zone. It has medium bold brown attractive seed size of 25.7 g/100 seed. It has an average yield of 16-17 q/ha and matures in 100-110 days. The variety has been released for cultivation in south zone comprising of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu.

IPCK 2013-163 (Madhav): The *kabuli* chickpea variety developed from the cross JGK-1 x Phule G 0517, is suitable for cultivation under timely sown irrigation condition in north west plain zone. It has attractive beige coloured seed of size 28.7 g/100 seed. It has an average yield of 19-20 q/ha and matures in 147 days. The variety has been released for cultivation in north west plain zone comprising of Punjab, Haryana, western Uttar Pradesh, north Rajasthan and Jammu and Kashmir.

Gujarat Kabuli Gram 1 (GJGK 1617): The extra large seeded *kabuli* chickpea variety developed from the cross ICC 14195P3 x ICCV 92337, is suitable for cultivation under timely sown irrigation condition in north west plain zone. It has attractive beige coloured seed of size 43.5 g/100 seed. It has an average yield of 1314 q/ha and matures in 143-148 days. The variety has been released for cultivation in north west plain zone comprising of Punjab, Haryana, western Uttar Pradesh, north Rajasthan and Jammu and Kashmir.

Kota Kabuli Chana 3 (RKGK 13-414): The *kabuli* chickpea variety developed from the cross BG 1044 x BG 1111, is suitable for cultivation under timely sown irrigation condition in west central zone. It has attractive beige coloured seed of size 27.3 g/100 seed. It has an average yield of 17-18 q/ha and matures in 100-115 days. The variety has been released for cultivation in west central zone comprising of Southern Rajasthan, Madhya Pradesh, Bundelkhand region of Uttar Pradesh, Gujarat and Maharashtra.

Karan Kabuli 4 (CSJK 174): The *kabuli* chickpea variety developed from the cross ICCV 2 x RSGK 6, is suitable for cultivation under timely sown irrigation condition in south zone. It has attractive beige coloured seed of size 37.82 g/100 seed. It has an average yield of 14-15 q/ha and matures in 100-115 days. The variety has been released for cultivation in south zone comprising of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu.

Samriddhi (IPCMB 19-3): The desi variety IPC MB 19-3, a *Fusarium* wilt resistant introgression line (WRIL) of Pusa 256, possessing the Wilt resistance race 2 on LG 2, introgressed in Pusa 256 from Vijay, is suitable for cultivation under timely sown irrigated condition in central zone. It has medium bold brown attractive seed size of 24.1 g/100 seed. It has an average yield of 20-21 q/ha and matures in 100-110 days. The variety has been released for cultivation in central zone comprising Madhya Pradesh, Maharashtra, Gujarat and Bundelkhand region of U.P.

IPC L 4-14 (IPC MAS-1): The desi variety IPC L 4-14, a drought tolerant introgression line (DTIL) of chickpea variety DCP 92-3, developed through introgression of “QTL hot spot” for drought tolerance from ICC 4958, is suitable for cultivation under timely sown rainfed condition in north west plain zone. It has small brown attractive seed size of 16.6 g/100 seed. It has an average

yield of 15-16 q/ha and matures in 128-133 days. The variety has been released for cultivation in north west plain zone comprising of Punjab, Haryana, western Uttar Pradesh and plains of Jammu and Kashmir.

Pusa Chickpea 4005 (BG 4005): The desi variety BG 4005, a drought tolerant introgression line (DTIL) of chickpea variety Pusa 362, developed through introgression of “QTL hot spot” for drought tolerance from ICC 4958, is suitable for cultivation under timely sown rainfed condition in north west plain zone. It has medium brown attractive seed size of 22.4 g/100 seed. It has an average yield of 16-17 q/ha and matures in 131 days. The variety has been released for cultivation in north west plain zone comprising of Punjab, Haryana, western Uttar Pradesh and plains of Jammu and Kashmir.

Germplasm Registered with NBPGR during 2021-22

National identity	Botanical Name	Developing institute	Novel unique features
IC0633092	<i>Cicer arietinum</i>	ARS, Kota	Resistant against Fusarium Wilt
EC720481	<i>Cicer echinospermum</i>	ICAR-NBPGR RS, Shimla	Resistant against Botrytis graymold
EC720438	<i>Cicer reticulatum</i>	ICAR-NBPGR RS, Shimla	Resistant against Ascochyta blight
EC267301	<i>Cicer arietinum</i>	ICAR-NBPGR, New Delhi	Resistance against Ascochyta blight.
IC248147	<i>Cicer arietinum</i>	ICAR-NBPGR, New Delhi	Resistance against Ascochyta blight.
IC640699	<i>Cicer arietinum</i>	ICAR-IIPR, Kanpur	Three seeds per pod in ~30% pods per plant with a mean of 2.62 seeds/ pod.
IC640700	<i>Cicer arietinum</i>	ICAR-IIPR, Kanpur	Tolerance to post emergent herbicide Imazethapyr
IC272450	<i>Cicer arietinum</i>	ICAR-IIPR, Kanpur	Tolerance against Heat

High yielding lines identified for different production conditions

On the basis of three years of multi-location evaluation, the promising desi chickpea genotypes for rainfed cultivation were GNG 2461 (2140 kg/ha) and GNG 2479 (2190 kg/ha) in NWPZ. Among *Kabuli* lines, RKG 13-416 (1621 kg/ha) in SZ was the high yielding genotypes. In DTIL trial, NC-7 (1366 kg/ha) and BG 10221 (1351 kg/ha) in CZ and NBeG 506 (1487 kg/ha) in SZ were the high yielding genotypes

Promising Entries

Based on 2021-22 of yield data, the following entries out yielded the best check variety by more than 5% in different trials.

Trial	Zone	Promising Entries (Kg/ha)
AVT 1 (D)	NEPZ	PG 265 (1949), DBG 3 (1894), KPG 59 [(ch) 1676]
	ECZ	NBeG 924 (1633), IPCB 2016-25 (1557), JG 315 [(ch) 1444]
IVT (D)	NWPZ	GNG 2562 (2766), GNG 1958 [(ch) 2596]
	NEPZ	H 19-21 (2074), GNG 2562 (2063), PG 290 (2056), BG 3043 [(ch) 1877]
	ECZ	Phule G 1302-3-5 (2110), GL 18149 (2049), CSG 15-3 (2002), RSGD 1125 (1984), RLBG 10 (1994), JG 315 [(ch) 1851]
	SZ	NBeG 1328 (2208), GJG 1903 (2206), JG 2021-67 (2173), Annegiri 1

		[(ch) 2066]
IVT (L)	NWPZ	BG 4031 (2227), GNG 2144 [(ch) 2049]
	NEPZ	JG 2021-71 (1737), BG 4031 (1706), RSGD 1155 (1597), GNG 2299 [(ch) 1459]
	ECZ	BG 4031 (3251), Phule G 1314-3-27 (3242), RKG 21-3 (3111), IG 21-05 (3106), IPC 2016-231 (2879), NBeG 1634 (2835), RVG 202[(ch) 2594]
IVT (RF)	WCZ	GJG 1913 (2064), GNG 2526 (2056), IG 2021-04 (2051), IPC2017-04 (2001), Vijay [(ch) 1904]
AVT 2(K)	SZ	RKG 13-416 (1723), CSJK 174 [(ch) 1556]
AVT 1(ELSK)	SZ	IGK 2020-02 (1287), MNK 1 [(ch) 1065]
IVT (K+ELSK)	SZ (K)	IPCK 2016-12 (1688), CSJK 174 (ch) [1509]
	SZ (ELSK)	IG21-01(1558), MNK 1 (ch) [1231]
AVT 1 (MH)	NEPZ	IPCB 2015-132 (1763), GJG 1913 (1724), RKGM 20-2 (1617), IG 2017-141 (1608), H 07-120(1566), GNG 2207 [(ch) 1499], HC 5 [(ch) 1461]
	SZ	GJG 1913 (2239), NBeG 1267 (2197), RKGM 20-1 (2091), JG 11 [(ch) 1960], GBM 2 [(ch) 1773]
IVT (MH)	NWPZ	BG 4037 (2702), GNG 2171 [(ch) 2566], HC 5 [(ch) 2484]
	NEPZ	H 19-36 (1721), IPC 2018-59 (1696), IPC 2017-351 (1656), RSGD 997 (1625), GL 17033 (1576), BG 4037 (1561), GL 19607 (1538), RKG 21-10 (1421), IPCB 2018-39 (1407), RSGD 965 (1406), DMHC 21-1104 (1367), RVSSG 110 (1345), IG 21-07 (1323), RG 2020-12 (1306), RG 2020-03 (1303), H 18-08 (1289), BRC 2021-10 (1276), PG 296 (1274), KCMH 20-15 (1268), DCMH 20-11 (1251), BG 4036 (1249), PBC 630 (1245), JG 2021-70 (1239), HC 5 [(ch) 1181]
	SZ	BG 4036 (2143), RKG 21-10 (2133), AKG 1402 (2002), RKG 21-9 (1919), DMHC 21-1108(1820),JG 11 [(ch) 1933], GBM 2 [(ch) 1723]
AVT (DTIL)	CZ	NC 9(1314), JAKI 9218[(Ch)1162]

Values in parenthesis are grain yield in Kg/ha

Estimation of genetic gain in Chickpea

An ERA trial in chickpea was conducted for two years viz 2019-20 and 2020-21 with 30 varieties released over 59 years (1960 to 2019) to estimate the genetic gain in Chickpea. The varieties included GNG 2207, Phule Vikram, CSJ 515, NBeG 3, PBG 7, GG 3, JG 14, GNG 1581, Pusa 547, JG 226, Digvijay, HC 5, RSG 931, JG 63, RSG 888, JG 16, JG 11, JAKI 9218, Vijay, KPG 59, GPF 2, Avrodhi, BG 256, JG 315, JG 74, K 850, Annegiri 1, JG 62, Radhey and C 235. The trial was conducted over five locations namely ICAR-IARI, ICAR-IIPR, IIPR, Bhopal, IIPR, Dharwad and MPKV, Rahuri. Observations were recorded on yield and component traits. The breeding effect was estimated as genetic gain for grain yield by regressing mean of grain yield against the year of release of that variety. The coefficient of linear regression gives the estimate of genetic gain in kg ha⁻¹yr⁻¹. The average genetic gain of 2.25 kg/ha/year was estimated.

Digitalization activities in AICRP on Chickpea

A. Digitalization of AICRP Chickpea Plant Breeding data and uploading to BMS: Zone-wise data of IVT (Desi – Irrigated; timely sown) trial of AICRP on Chickpea for the period 2006-07 to 2018-19 has been uploaded in the Breeding Management System. These included IVT (Desi – Irrigated; timely sown) yield data for five zones namely North West plain Zone (NWPZ),

North East Plain Zone (NEPZ), West Central Zone (WCZ), East Central Zone (ECZ) and South Zone (SZ).

B. Digital Data Recording of AICRP on Chickpea trials: Hand held digital data recording devices have been distributed to coordinating centres and ICAR-IIPR Chickpea and Pigeonpea breeding programmes. Besides, the field layout, experimental design and data sheet have been generated for Initial Variety (Desi-Irrigated timely sown) trial under AICRP on Chickpea for nine centres in Central Zone.

C. Product Profile of Chickpea : The AICRP on Chickpea has developed product profile of *desi* and *kabuli* varieties for different zones viz., NWPZ, NEPZ, WCZ, ECZ and SZ to ascertain the direction of future breeding. This profile provides necessary characters in a variety needed to replace old variety. This includes basic traits/USP's, value added traits, benchmark lines, level of increase and time schedule for improvement. Chickpea breeding groups at ICAR-IARI and ICAR-IIPR have adopted two product profiles each with suitable modification for implementation in their breeding programmes.

D. Integration of Genomic Selection in Chickpea Breeding

During 2021-22, the Genomic selection-based crossing was taken up at two major centres ICAR-IARI and ICAR-IIPR Kanpur. Molecular marker-based confirmation for the hybridity was done to identify true to type hybrids. After merging the markers from the training and prediction set a reducing set of common markers were identified and its prediction accuracy was validated. All cross-validation accuracies were reported from a 10-fold consolidation scheme. A single correlation coefficient between the “true” estimated genotypic values and the genomic predicted values for all individuals was estimated based on predictions for all the folds. Each cross validation was repeated 10 times with new random folds. These predictions were based on the phenotypic values of *desi* lines. Low prediction accuracy was encountered when *kabuli* training population was used to predict *desi* types. Additionally, when *Desi* and *Kabuli* types are predicted separately from one another, all accuracies tend to decrease. This can be due to two factors. First, that less individuals / phenotypic records may be reducing accuracy. Second, some of the accuracy is due to large differences between the two populations. Prediction of performance of *desi* lines based on *kabuli* lines generally reduced accuracies. Hence prediction accuracies should only be evaluated within seed type. All traits showed significant genotype by program interactions. The model was validated using two separate chickpea breeding programmes having their own training population and the effect of inclusion of the phenotypes from the other program on prediction accuracy was also estimated. It was observed that inclusion of phenotypes from the other program tended to reduce accuracy within the program. This is true in case the breeding programmes differ significantly. However, earlier estimates with both univariate (single trait) and multivariate (multi-trait) cross-validation has shown that prediction accuracies do not vary between similar population-based programmes.

Pre Breeding

At ICAR-IIPR Kanpur, four crosses were developed for cold tolerance and earliness using *C reticulatum* accessions ILWC 104, 105 and 106 as donors and seven targeting the podding properties (cylindrical pods, flat pods, long pods) utilizing the improved landrace donors. Besides,

generation advancement of the populations derived from pre-breeding hybridizations and wide hybridizations was carried out based on target trait and grain attributes. One hundred and thirteen wild germplasm accessions belonging to 7 *Cicer* spp. was maintained in the wild garden and 250 accessions (working collection) comprising of landraces, trait specific donors, exotic lines etc. were rejuvenated at IIPR during 2021-22. Wild accessions identified for resistance to Ascochyta blight, namely ICC17149 (CJ), ICC17207 (CJ), ICC17152 (CP) and ILWC246 (CE) by cut-twig method. At PAU, Ludhiana, 43 accessions of different wild *Cicer* species (*C. reitculatum*, *C. pinnatifidum* and *C. judaicum*) are being maintained. Five inter-specific crosses were attempted during 2021-22. Under basic and strategic research, MABC work is being performed in two crosses namely PBG 7/ WR 315 for Fusarium wilt and L 552/ ILC 3279 for Ascochyta blight. During 2021-22, BC₃F₃ and BC₂F₄ of PBG7/WR315 and BC₃F₃ along with BC₂F₅ and BC₁F₄ of L552/ILC3279 were evaluated and background selection is in progress using polymorphic SSR markers. F_{2:3} population of JG14 x GLWP61 has been evaluated for Botrytis grey mould and Ascochyta blight along with yield traits. Mapping for nodulation traits has been done for GPF 2 x ILWC 141 RIL population crosses. Mapping for AB is in progress using RIL intra-specific population: HC5 x PBG7. Two inter-specific RIL populations are under development stage. At ICAR-IARI, 162 landraces are being maintained at IARI apart from 84 pre-breeding derivative families and two mapping populations of BGD 112 x FLIP 90-166 and Pusa 1053 x ILWC 118. The variability and range of various quantitative trait was documented in the land races and good variability has been observed. Wide crosses involving Indian entries and wild parents/ Land races (donors for various traits) has been done. These include the crosses with Gokcee, *Cicer reticulatum*, *C. pinnatifidum*, ILWC 46, ILWC 141, ILWC 115. 15 wide crosses 15 advance backcross lines involving Pusa 256 x *C echinospermum* (BC₂F₆) raised and BC₂F₅ lines of Pusa 5023 x Gokcee cross were generated (20) for transfer of drought tolerance from Gokcee to Pusa 5023. Gokcee is a drought tolerant line received from ICARDA. A total of 84 different prebreeding/landrace families are now being maintained at IARI in different generations of different cross combinations.

National Crossing Programme

In order to develop a pool of segregating materials, station and national crossing programme were organized at AICRP-Chickpea centres. Centres attempted 521 crosses as per need of the region under national (105 crosses) and station (472 crosses) crossing programme. Crosses were made under national crossing programme at PAU, Ludhiana (6), MPKV, Rahuri (5), CCSHAU, Hisar (4), RAK CoA, Sehore (6), ARS, Sriganaganagar (5), JAU, Junagadh (5), BAU, Sabour (4), ARS, Kota (10), IGKV, Raipur (5), JNKVV, Jabalpur (4), TCA, Dholi (5), NDUA&T, Kumarganj (2), RARS, Nandyal (4), ARS, Badnapur (2), PDKV, Akola (8), RLB CAU, Jhansi (5), RARI, Durgapura (7), RARS, Vijayapur (4), ARS, Kalaburagi (5), CAU Imphal (2), ARS, Banswara (2), GBPUAT, Pantnagar (2) and BAU, Ranchi (3) and the seeds of these crosses will be advanced and segregating material will be shared among various centres for further selection.

Shuttle Breeding Programme

Shuttle Breeding provides an opportunity for flow of breeding material of diverse origin among cooperative centres of AICRP on Chickpea to strengthen the breeding programmes. The material developed through this project also served as input to breeding programme of various

ecosystems. During 2021-22, bulk seeds of advanced breeding material (F₃ and F₄) were supplied to 18 centres for strengthening and broadening their breeding material. These included a total of 56 crosses supplied to Akola (5 crosses), Badnapur (3 crosses), Dholi (5 crosses), Hisar (3 crosses), Jhansi (2 crosses), Junagadh (1 cross), Kalyani (2 crosses), Kota (2 crosses), Ranchi (5 crosses), Sabour (2 crosses), Samba (2 crosses), Sehore (3 crosses), Shillongani (3 crosses), Jabalpur (2 crosses), Imphal (2 crosses), Vijayapur (6 crosses), Durgapura (4 crosses) and Kalaburagi (3 crosses).

For the current year, F₂ Bulks of 18 crosses from JAU, Junagadh are available for distribution among cooperative centres. ICAR-IIPR has F₂ and F₃ bulks of 13 crosses for distribution to different centres. Bulks from F₃ breeding material from 10 crosses are available for sharing under shuttle breeding programme at JNKVV, Jabalpur. PAU, Ludhiana has 5 inter-specific cross materials in F₇ and F₈ which are available for distribution to other centres. Bulks from F₃ and F₄ breeding material are available for sharing under shuttle breeding programme at ARS, Kota.

Off-Season Nursery

Segregating materials of chickpea for generation advancement during off season of 2021-22 were received from AICRP centres Junagadh, Jabalpur, Sriganaganagar, Ludhiana, Vijapura and IIPR, Kanpur. A set 202 progenies is being advanced at ICAR-IIPR Off-season Research Station, Dharwad by PAU, Ludhiana. 18 crosses were developed at RRS Dharwad Off-season nursery by IIPR, Kanpur. At PAU off-season Research Station, Keylong (H.P.), 25 elite parental lines are grown for attempting crosses along with 194 progenies for advancement.

Genetic resource management

15,654 accessions were maintained at 23 centres. These accessions were evaluated for morphological traits and are being maintained.

Breeder Seed Production

8656.43 q of breeder seed of 65 chickpea varieties was produced against DAC indent of 6098.69 q including the carry over seed of indented varieties available with seed producing centres. In this way, breeder seed production was surplus by 2557.75 q against the DAC indent

CROP PRODUCTION

Agronomy

- ❖ Oxyfluorfen, a pre-emergence herbicide in chickpea was evaluated alone or in combination with POE herbicides (quizalofop-p-ethyl, propaquizafop and topramezone) at different locations/zones. In NWPZ, pre-emergence (PE) application of oxyfluorfen 150 or 250 g/ha and post-emergence (POE) application of quizalofop-p-ethyl 100 g/ha performed better whereas, combined application of PE + POE observed better in NEPZ. In CZ & SZ, oxyfluorfen 150 g/ha (PE) + propaquizafop 100 g/ha (POE) was found effective.
- ❖ The variable response of topramezone (dose & application time) was observed at different zones and locations in controlling weeds in chickpea. In NWPZ at Ludhiana, topramezone 25.7 g/ha at 21 DAS showed superiority among other doses and application time. In NEPZ & SZ, topramezone 20.6 or 25.7

g/ha at 21 DAS has shown superiority whereas in CZ, topramezone 20.6 or 25.7 g/ha applied at 14 DAS proved better option.

- ❖ Customized fertilizer was evaluated at six locations across the zones. The significant response of application of customized fertilizer was observed in increasing the grain yield of chickpea across the zones at all locations. Based on the study, customized fertilizers (NPKSZnMo) based on recommendation 100% can be recommended for obtaining higher yield of chickpea.
- ❖ Under rainfed situation, Hydrogel application improved the grain yield of chickpea. Maximum grain yield of chickpea was recorded under Hydrogel 5.0 kg/ha and least under control. However, application of Hydrogel 2.5 kg/ha recorded at par grain yield with Hydrogel 5.0 kg/ha at Nandyal centre.

Microbiology

- ❖ Multilocation testing of eight elite *Mesorhizobium* strains at five different centers showed that strain KBR16-18 (Kalaburagi) and BIONPK-NBAIM out yielded all other strains with an increase of 16% in grain yield over the un-inoculated control. However, CR 53 (Pantnagar) enhanced yield by 15.1%, over the un-inoculated control. Delhi Strain DMR-1 was found at par with 20 kg N/ha treatment for grain yields by 13.2% over control.
- ❖ Application of microbial consortium for alleviating moisture stress in chickpea revealed treatment T7-RFC 117+MCII (IIPR-Kanpur) followed by T6- RFC 117+ Archeal Bioformulation- NBAIM improved the grain yield by 19.3 % and 18. 1% over Farmer's practice on the basis of pooled data across the 4 locations.
- ❖ On the basis of pooled data across the locations, maximum improvement in grain yield by 22.5% over control was recorded with T1+ 25 kg ZnSO₄/ha (Soil application) + Zn and Fe solubilizers followed by T1+ 0.5% ZnSO₄+0.1% FeSO₄ /ha (Foliar spray) + Zn and Fe solubilizers (19%) and T1+25 kg ZnSO₄/ha (Soil application) (15.3%) over control. Whereas, T1+Zn and Fe solubilizers treatment improved the yield by only 12% over control treatment. However, significantly higher DTPA extractable zinc and iron was recorded in microbial mediated treatments.

CROP PROTECTION

Plant Pathology

- ❖ Eight *Trichoderma* strains obtained from various sources, including NCIPM, NBAIR, NRRI and *Trichoderma* mutant from BARC were used as seed treatment and compared with chemical seed treatment for the management of wilt and dry root rot diseases of chickpea. On an average seed treatment with *Trichoderma* mutant was most effective followed by *T.harzianum* T6 + Propineb (@ 10g + 1.5g/kg seed) in minimizing wilt/DRR incidence.
- ❖ One hundred six entries showing resistant/moderately resistant reaction to wilt were screened for confirmation of wilt resistance at different location having established wilt plots. Sixty six entries viz. PG 237, BG 4018, GNG 2462, GG 14, GLK 17032, BCP 61, BDNG 2017-44, GNG 2461, GL 16056, BCP 49, RSGD 1071, BDNG 2017-49, FLIP 88-85C-1FC-S1, IFLRP F4-S2, FLIP 09-191C-IFC-S2, IFLRP F4-S5, RVSSG 89, RVSSG 97, IGK 2021-116, RVSSG 94, FLIP 10-89-IFC-S2, IGK 2021-116, FLIP 09-243C-S4, GNG 2461, GNG 2510, GJG 1815, GJG 1803, GJG 1907, GJG 1809, GJG 1912, Phule G 1221-1, Phule G 1210-01, Phule G 1131-4, NBeG 798, NBeG 690, H 09-90, H 16-05, H 17-16, GJG 2005, GJG 2006, GJG 2019, NBeG 789, NBeG 690, H 09-90, H 16-05, H 17-16, GJG 2005, GJG 2006, IG 2021-109, IG 2021-107, IG 2021-300, IG 2021-284, IG 2021-281, IG 2021-106, IG 2021-108, IG 2021-258, IG 2021-383, ICCV 05530, ICCV 98503, ICCV 07111, ICCV 16134, ICCV 13616, ICCV 16505, ICCV 05534 and ICCV 07104 expressed resistance/tolerance to wilt at five or more locations, confirming the previous year results.

- ❖ GNG 2461, GJG 1907, IPCKB 2016-133 and IG 2021-104 were found moderately resistant to DRR in multilocation testing.

Entomology

- ❖ In evaluation of ecofriendly approaches (NBAIR) for the management of gram pod borer, *H. armigera* the treatment Chlorantraniliprole 18.5 SC % @ 0.25 ml/litre had recorded significantly lower pod damage, less larval population and highest grain yield of chickpea than all other treatments. Among bioinsecticides, HaNPV NBAIR1@4 ml/L, Mahastra 0.5% Bt @ 4g/litre and *Bacillus thuringiensis* NBAIR Bt G4@ 20 ml/litre water and home made neem @10% were significantly superior than control and were at par with each other in terms of larval population, pod damage and grain yield of crop.
- ❖ The IPM module (NCIPM) resulted in lesser larval load of *H armigera*, lower pod damage and higher grain yield as well as more natural enemies as compared to the farmer's practice, resulting in higher net returns.
- ❖ In bio-intensive management of pulse bruchids in chickpea under storage conditions, Deltamethrin 2.8 EC @ 0.04 ml/kg followed by Neem oil @ 5ml/kg and Diatomaceous earth @ 5g/kg were found significantly superior in reducing the bruchid infestation at various intervals ie; (3, 6, 9 and 12 months) with lowest per cent infestation after 12 months of storage.

Front Line Demonstrations

- ❖ Four hundred and Twenty demonstrations were conducted on package technology. On an average, 1611 kg/ha of yield was obtained through package technology against 1306 kg/ha by farmer's practice with an increase in grain yield by 23.3 percent.
- ❖ Seventy-five demonstrations were conducted on package technology in rice fallow. The overall mean grain yield of package technology in rice fallow was 1319 kg/ha and mean yield of local practice was 1014kg/ha. The percent increase in grain yield was 30.1%.
- ❖ Five demonstrations were conducted on Insect Pest management technology. The overall mean grain yield through IPM was 1592 kg/ha and mean yield of local practice was 1332 kg/ha. The percent increase in grain yield was 20.2.
- ❖ Six Hundred and fifty demonstrations were conducted in tribal areas under Tribal Sub plan which gave an average yield of 1352 kg/ha which was 26.0% higher than yield obtained through traditional practices and varieties (1073 kg/ha).

BUDGET DETAILS

Head wise break up of Plan Budget Expenditure in respect of AICRP on Chickpea under DARE/ICAR 2021-22

(Rs. In lakh)

Heads	
A. Other than NEH	
a. Grant in Aid-Capital	-
b. Grant in Aid-Salary	1109.50
c. Grant in Aid-General	211.19
Total	1320.69
B. NEH	
a. Grant in Aid-Capital	6.10
b. Grant in Aid-Salary	100.00
c. Grant in Aid-General	3.00
Total	109.10
Grand Total	1429.79

Weighted Mean

Desi (Rainfed): NWPZ				Yield (Kg/ha)
Entries	AVT 2 (2020-21)	AVT 1 (2020-21)	IVT (2019-20)	Weighted Mean
GNG 2461	2217(5)	1698(2)	2390(2)	2140(9)
GNG 2479	2210(5)	1861(2)	2471(2)	2190(9)
RSG 888 (ch)	1734(5)	1205(2)	2070(2)	1691(9)
CSJ 515 (ch)	2180(5)	1417(2)	2076(2)	1987(9)
RSG 931 (ch)	1886(5)	1415(2)	1949(2)	1795(9)

Kabuli: SZ				Yield (Kg/ha)	
Entries	AVT 2 (2021-22)	AVT 1 (2020-21)	AVT 1 (2019-20)	IVT (2018-19)	Weighted Mean
RKG 13-416	1723(3)	1662(3)	1497(3)	1608(4)	1621(13)
NBeG 119 (ch)	1277(3)	1247(3)	1361(3)	1383(4)	1322(13)
KAK 2 (ch)	1406(3)	1172(3)	1363(3)	1278(4)	1303(13)
Vihar (ch)	1545(3)	1285(3)			1415(13)

DTIL: CZ			Yield (kg/ha)
Entries	AVT 2 (2020-21)	AVT 1 (2020-21)	Weighted Mean
NC7 (Base JG 16)	1488(3)	1184(2)	1366(5)
BGM 10221 (Base JG 16)	1532(3)	1080(2)	1351(5)
JG 16 (N ch)	1319(3)	1252(2)	1292(5)

DTIL: SZ			Yield (kg/ha)
Entries	AVT 2 (2021-22)	AVT 1 (2020-21)	Weighted Mean
NBeG 506 (Base JG 11)	1361(3)	1576(4)	1484(7)
JG 11 (NC)	1448(3)	1471(4)	1461(7)

ACTION TAKEN REPORT

S.No	Action Point	Action Taken
1.	Multiple crosses should be promoted and the national crossing programme should be according to the product profile developed for different zones.	A large number of multi-parent crosses (62 crosses) were made by AICRP centres involving newly identified donors for different traits.
2.	Programme on interspecific hybridization needs to be strengthened and their derivatives should be shared among the centres.	A strong inter-specific breeding programme is conducted at selected centres like PAU, Ludhiana, ICAR-IIPR, ICAR-IARI etc. involving <i>C. reticulatum</i> , <i>C. echinospermum</i> , <i>C. pinnatifidum</i> and other species and segregants from these interspecific crosses were shared among AICRP centres for strengthening their breeding programmes.
3.	All newly created centres need to generate breeding material, evaluate germplasm and should indent for segregating material to start with.	All the centres of AICRP are generating breeding material. Breeding program at newly created centres are augmented by sharing of segregating material. During 2015-16 to 2021-22, seeds of 922 crosses have been shared with 31 centres under shuttle breeding program.
4.	Priority should be accorded to pyramiding of genes for wilt, DRR, CR with multiple race resistance against FW.	New crosses are attempted among resistant donors for pyramiding genes for DRR and FW resistance. Marker Assisted Backcrossing (MABC) has been employed to pyramid FW genes for resistance against Fusarium wilt races 1, 2, 3 and 4.
5.	Trait specific germplasm identified through multi-location evaluation should be registered with NBPGR.	Eight accessions were registered with NBPGR for Fusarium wilt resistance (RKG 13-55), Ascochyta blight resistance (ILWC 29, EC 267301, IC 248147), BGMresistance (ILWC 246), >3 seeds/pods (IPC 2020-98), Post emergence herbicide tolerance (ICC 12315) and heat tolerance (ICC 15925).
6.	Priority should be accorded to development of varieties suitable for machine harvesting with lodging resistance.	One lodging resistant variety, amenable to machine harvesting (RVG 204) was released during 2021-22.
7.	Digitalization of historical data of AICRP on Chickpea and modernization of breeding programme need to be done. Data should be available to all the centres on some	The data of IVT (Desi-Irrigated, timely sown) trial for 2005 to 2019 has been digitalized and was uploaded on BMS platform of ICRISAT. Recently, the data is being migrated to ICAR-IASRI server and will be

	electronic platform.	made available to centres.
8.	New <i>Trichoderma</i> strains from ICAR-NBAIM, ICAR-NBAIR and ICAR-NCPIM should be evaluated for the management of Wilt/DRR and moisture stress.	Eight <i>Trichoderma</i> strains obtained from NCPIM, NBAIM, NBAIR and BARC were evaluated and found effective in the management of Wilt/DRR.
9.	Bio-control technologies and IPM modules developed by ICAR-NBAIR and ICAR-NCIPM for the management of pod borer need to be validated.	Among bioinsecticides HaNPV NBAIR1@4 ml/L, and <i>Bacillus thuringiensis</i> NBAIR Bt G4@ 20 ml/litre water were significantly superior than control. The IPM module (NCIPM) resulted in lesser larval load of <i>H. armigera</i> , lower pod damage and higher grain yield.
10.	Entries included in DTIL trial should be screened for resistance to DRR also.	Drought tolerant lines were screened for DRR reaction at 6 locations but no significant correlation between drought tolerance & DRR resistance found.
11.	Priority should be accorded to develop short duration varieties for terminal stresses tolerance and root disease resistance.	Chickpea breeding program at coordinating centres has been reoriented by inclusion of donors of less than 100 days duration with abiotic and biotic stress resistance. During last year, five varieties of short duration with tolerance to root diseases were developed.
12.	Integration of advanced molecular breeding tools like genomic selection (GS) for modernization of chickpea breeding should be done.	Genomic selection has been integrated with chickpea breeding in the country. A training population of more than 400 lines including varieties, breeding lines and donors have been constituted and promising lines have been identified based on GEBV's for first cycle of crossing.

Acknowledgement

I acknowledge with thanks the efforts of the cooperating scientists for carrying out the coordinated trials as well as Vice Chancellors and Directors of Research and other officers of state Agricultural Universities and Departments of Agriculture for facilitating the implementation of the envisaged program. I am also grateful to all the Principal Investigators of project, Scientists, Technical officers, staff members of Administration & Accounts section of ICAR-IIPR, Kanpur for their significant contributions.

Place: Kanpur
Date: 04 August, 2022

(G.P. Dixit)
Project Coordinator

All India area, production and yield of total pulses and chickpea in India

Year	Total Pulses			Year	Chickpea		
	A	P	Y		A	P	Y
1950-51	19.09	8.41	441	1950-51	7.57	3.65	482
1951-52	18.78	8.42	448	1951-52	6.83	3.39	496
1952-53	19.84	9.19	463	1952-53	7.26	4.21	580
1953-54	21.73	10.62	489	1953-54	7.97	4.83	606
1954-55	21.91	10.95	500	1954-55	9.25	5.62	608
1955-56	23.22	11.04	476	1955-56	9.78	5.42	554
1956-57	23.32	11.55	495	1956-57	9.67	6.23	644
1957-58	22.54	9.56	424	1957-58	9.09	4.89	538
1958-59	24.31	13.15	541	1958-59	10.08	7.02	697
1959-60	24.83	11.80	475	1959-60	10.33	5.62	544
1960-61	23.56	12.70	539	1960-61	9.28	6.25	674
1961-62	24.24	11.76	485	1961-62	9.57	5.79	605
1962-63	24.27	11.53	475	1962-63	9.19	5.36	583
1963-64	24.18	10.07	416	1963-64	9.35	4.50	481
1964-65	23.88	12.42	520	1964-65	8.87	5.78	651
1965-66	22.72	9.94	438	1965-66	8.02	4.22	527
1966-67	22.12	6.35	377	1966-67	8.00	3.62	453
1967-68	22.65	12.10	534	1967-68	8.26	5.97	723
1968-69	21.26	10.42	490	1968-69	7.11	4.31	607
1969-70	22.02	11.69	531	1969-70	7.75	5.55	715
1970-71	22.54	11.82	524	1970-71	7.84	5.20	663
1971-72	22.15	11.09	501	1971-72	7.91	5.08	642
1972-73	20.92	9.91	474	1972-73	6.97	4.54	651
1973-74	23.43	10.01	427	1973-74	7.76	4.10	528
1974-75	22.03	10.02	455	1974-75	7.04	4.02	570
1975-76	24.45	13.04	533	1975-76	8.32	5.88	707
1976-77	22.98	11.36	494	1976-77	7.97	5.42	680
1977-78	23.50	11.97	510	1977-78	7.97	5.41	678
1978-79	23.66	12.18	515	1978-79	7.71	5.74	745
1979-80	22.26	8.57	385	1979-80	6.99	3.36	481
1980-81	22.46	10.63	473	1980-81	6.58	4.33	657
1981-82	23.84	11.51	483	1981-82	7.87	4.64	590
1982-83	22.83	11.86	519	1982-83	7.40	5.29	715
1983-84	23.54	12.89	548	1983-84	7.16	4.75	663
1984-85	22.74	11.96	526	1984-85	6.91	4.56	661
1985-86	24.42	13.36	547	1985-86	7.80	5.79	742
1986-87	23.16	11.71	506	1986-87	6.98	4.53	649

1987-88	21.27	10.96	515	1987-88	5.77	3.63	629
1988-89	23.15	13.85	598	1988-89	6.81	5.13	753
1989-90	23.41	12.86	549	1989-90	6.47	4.22	652
1990-91	24.66	14.26	578	1990-91	7.52	5.36	712
1991-92	22.54	12.02	533	1991-92	5.58	4.12	739
1992-93	22.36	12.82	573	1992-93	6.45	4.42	684
1993-94	22.25	13.30	598	1993-94	6.36	4.98	783
1994-95	23.03	14.04	610	1994-95	7.54	6.44	853
1995-96	22.28	12.31	552	1995-96	7.12	4.98	700
1996-97	22.45	14.24	635	1996-97	6.85	5.57	813
1997-98	22.87	12.98	567	1997-98	7.56	6.13	811
1998-99	23.50	14.91	634	1998-99	8.47	6.80	803
99-2000	21.12	13.42	635	99-2000	6.15	5.12	833
2000-01	20.35	11.08	544	2000-01	5.19	3.86	744
2001-02	22.01	13.37	607	2001-02	6.42	5.47	853
2002-03	20.50	11.13	543	2002-03	5.91	4.24	717
2003-04	23.46	14.91	635	2003-04	7.05	5.72	811
2004-05	22.76	13.13	577	2004-05	6.71	5.47	815
2005-06	22.39	13.39	598	2005-06	6.93	5.60	808
2006-07	23.76	14.20	598	2006-07	7.63	6.33	830
2007-08	23.81	14.76	620	2007-08	7.58	5.75	759
2008-09	22.99	14.57	638	2008-09	7.89	7.06	895
2009-10	23.35	14.66	625	2009-10	8.17	7.48	915
2010-11	26.28	18.24	689	2010-11	9.19	8.22	895
2011-12	24.46	17.09	699	2011-12	8.32	7.70	912
2012-13	23.47	18.34	750	2012-13	9.51	8.83	929
2013-14	25.26	19.25	764	2013-14	9.93	9.53	960
2014-15	23.55	17.15	728	2014-15	8.25	7.33	889
2015-16	24.91	16.35	656	2015-16	8.39	7.06	840
2016-17	29.44	23.13	786	2016-17	9.63	9.38	974
2017-18	29.81	25.41	853	2017-18	10.56	11.37	1077
2018-19	29.16	22.08	757	2018-19	9.55	9.94	1041
2019-20	27.99	23.02	8.23	2019-20	9.68	11.08	1142
2020-21	28.78	25.46	885	2020-21	9.99	11.91	1192
2021-22*	-	27.75	-	2021-22*	-	13.98	-

A : Area (million ha)

P : Production (million tons)

Y : Yield (Kg/ha)

* 3rd Advance estimates as on 19.05.2022

Source: Agricultural Statistics Division, Directorate of Economics & Statistics, Department of Agriculture & Cooperation

Area, production and yield of chickpea in different states

Year	Andhra Pradesh			Year	Bihar		
	A	P	Y		A	P	Y
1971-72	66.00	25.00	379	1971-72	241.00	170.00	705
1972-73	70.00	18.00	257	1972-73	262.00	134.00	511
1973-74	58.00	20.00	345	1973-74	260.00	114.00	438
1974-75	68.00	28.00	412	1974-75	248.00	157.00	633
1975-76	88.00	37.00	420	1975-76	245.00	135.00	551
1976-77	77.00	24.00	312	1976-77	221.00	141.00	638
1977-78	63.00	21.00	333	1977-78	227.00	124.00	546
1978-79	57.00	16.00	281	1978-79	217.00	134.00	618
1979-80	54.00	19.00	352	1979-80	184.00	112.00	609
1980-81	46.00	14.00	304	1980-81	196.00	141.00	719
1981-82	52.00	24.00	462	1981-82	173.00	124.00	717
1982-83	60.00	26.00	433	1982-83	192.00	141.00	734
1983-84	59.00	23.00	390	1983-84	189.00	166.00	878
1984-85	52.00	17.00	327	1984-85	173.00	143.00	827
1985-86	49.00	17.00	347	1985-86	191.00	160.00	838
1986-87	60.00	15.00	250	1986-87	186.00	150.00	806
1987-88	53.00	19.00	358	1987-88	185.00	140.00	757
1988-89	48.00	25.30	527	1988-89	148.00	129.90	878
1989-90	61.00	36.90	605	1989-90	170.00	139.00	817
1990-91	88.00	56.90	647	1990-91	168.00	157.80	939
1991-92	64.00	47.00	734	1991-92	150.00	148.00	987
1992-93	60.00	28.00	467	1992-93	127.00	109.00	858
1993-94	89.00	65.00	730	1993-94	132.00	140.00	1061
1994-95	168.00	136.00	810	1994-95	144.00	159.00	1104
1995-96	113.00	71.00	628	1995-96	141.00	92.00	652
1996-97	106.00	90.00	849	1996-97	126.00	126.70	1006
1997-98	147.00	90.00	612	1997-98	121.70	91.30	750
1998-99	146.00	130.00	890	1998-99	109.10	119.00	1091
99-2000	163.00	95.10	583	99-2000	97.80	95.40	975
2000-01	201.00	229.00	1139	2000-01	76.20	78.70	1033
2001-02	285.00	363.00	1274	2001-02	68.20	65.30	957
2002-03	390.00	382.00	979	2002-03	71.40	72.10	1010
2003-04	422.00	457.00	1083	2003-04	80.30	78.60	979
2004-05	341.00	345.00	1012	2004-05	72.10	60.20	835
2005-06	394.00	627.00	1591	2005-06	92.40	80.60	872
2006-07	602.00	653.00	1085	2006-07	133.40	117.20	879
2007-08	630.00	912.00	1448	2007-08	142.70	136.00	953
2008-09	610.00	860.00	1412	2008-09	65.00	60.00	925
2009-10	650.00	850.00	1308	2009-10	60.00	60.00	1000
2010-11	580.00	720.00	1241	2010-11	60.00	73.00	1200
2011-12	570.00	520.00	920	2011-12	60.00	67.00	1134
2012-13	681.00	759.00	1115	2012-13	60.50	86.50	1430
2013-14	472.1	596.7	1264	2013-14	61.30	70.3	1147
2014-15	342.00	391.00	1143	2014-15	60.00	57.50	958
2015-16	471.00	500.00	1062	2015-16	59.37	58.55	986
2016-17	397.00	381.00	960	2016-17	59.36	66.50	1120
2017-18	520.00	588.64	1132	2017-18	58.22	67.19	1154
2018-19	478.00	243.00	508	2018-19	56.00	68.00	1199
2019-20	459.00	559.06	1218	2019-20	52.80	38.55	730
2020-21	469.00	532.78	1136	2020-21	51.81	54.50	1052

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Gujarat			Year	Haryana		
	A	P	Y		A	P	Y
1971-72	57.00	40.00	702	1971-72	1119.00	647.00	578
1972-73	34.00	28.00	824	1972-73	970.00	551.00	568
1973-74	59.00	54.00	915	1973-74	994.00	448.00	451
1974-75	37.00	15.00	405	1974-75	704.00	343.00	487
1975-76	77.00	54.00	701	1975-76	1106.00	907.00	820
1976-77	77.00	49.00	636	1976-77	1029.00	824.00	801
1977-78	71.00	39.00	549	1977-78	1149.00	965.00	840
1978-79	66.00	59.00	894	1978-79	1063.00	1044.00	982
1979-80	66.00	31.00	470	1979-80	553.00	316.00	571
1980-81	64.00	47.00	734	1980-81	741.00	466.00	629
1981-82	88.00	70.00	795	1981-82	1044.00	309.00	296
1982-83	157.00	121.00	771	1982-83	508.00	282.00	555
1983-84	122.00	117.00	959	1983-84	647.00	315.00	487
1984-85	116.00	101.00	871	1984-85	622.00	319.00	513
1985-86	81.00	46.00	568	1985-86	758.00	622.00	821
1986-87	44.00	28.00	636	1986-87	610.00	413.00	677
1987-88	20.00	11.00	550	1987-88	200.00	66.00	330
1988-89	108.00	65.50	606	1988-89	645.00	604.00	936
1989-90	66.00	60.50	917	1989-90	368.00	700.00	1902
1990-91	170.00	115.80	681	1990-91	649.00	469.00	723
1991-92	67.00	40.00	597	1991-92	305.00	201.00	659
1992-93	123.00	78.00	634	1992-93	387.00	259.00	669
1993-94	97.00	55.00	567	1993-94	405.00	403.00	995
1994-95	153.00	122.00	797	1994-95	403.00	443.00	1099
1995-96	82.00	50.00	610	1995-96	377.00	381.00	1011
1996-97	135.00	94.70	701	1996-97	345.00	276.00	800
1997-98	112.30	98.80	880	1997-98	355.00	310.00	873
1998-99	143.90	125.30	871	1998-99	357.00	295.00	826
99-2000	81.90	41.90	512	99-2000	100.00	58.00	580
2000-01	17.00	9.00	529	2000-01	125.00	80.00	640
2001-02	49.10	27.20	554	2001-02	143.00	122.00	853
2002-03	57.50	28.90	503	2002-03	55.00	41.00	745
2003-04	149.60	132.30	884	2003-04	123.00	100.00	813
2004-05	122.70	98.50	803	2004-05	107.00	91.00	850
2005-06	167.00	142.00	850	2005-06	130.00	72.00	554
2006-07	246.00	214.00	870	2006-07	108.00	91.00	843
2007-08	215.00	210.00	977	2007-08	107.00	54.00	505
2008-09	180.00	180.00	1011	2008-09	120.00	130.00	1041
2009-10	130.00	130.00	947	2009-10	80.00	60.00	738
2010-11	180.00	200.00	1111	2010-11	110.00	110.00	1000
2011-12	240.00	270.00	1138	2011-12	80.00	70.00	911
2012-13	172.00	196.00	1140	2012-13	47.00	53.00	1128
2013-14	247.00	309.00	1251	2013-14	83.0	75.0	904
2014-15	161.00	199.00	1236	2014-15	65.00	42.00	646
2015-16	115.00	153.00	1330	2015-16	42.00	26.00	619
2016-17	164.00	183.00	1116	2016-17	37.00	44.00	1189
2017-18	293.00	376.51	1285	2017-18	32.00	36.00	1125
2018-19	173.00	235.00	1358	2018-19	45.00	62.00	1385
2019-20	405.05	635.12	1568	2019-20	44.00	47.14	1072
2020-21	816.21	1279.82	1568	2020-21	35.69	35.87	1005

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Karnataka			Year	Madhya Pradesh		
	A	P	Y		A	P	Y
1971-72	152.00	62.00	408	1971-72	1686.00	1148.00	681
1972-73	132.00	20.00	152	1972-73	1625.00	1109.00	682
1973-74	158.00	75.00	475	1973-74	1851.00	1056.00	571
1974-75	163.00	66.00	405	1974-75	1842.00	1144.00	621
1975-76	192.00	89.00	464	1975-76	1917.00	1226.00	640
1976-77	163.00	50.00	307	1976-77	2018.00	1049.00	520
1977-78	168.00	59.00	351	1977-78	1780.00	907.00	510
1978-79	164.00	69.00	421	1978-79	1739.00	1032.00	593
1979-80	153.00	69.00	451	1979-80	2174.00	924.00	425
1980-81	144.00	58.00	403	1980-81	1807.00	1063.00	588
1981-82	137.00	60.00	438	1981-82	2029.00	1362.00	671
1982-83	145.00	69.00	476	1982-83	2387.00	1644.00	689
1983-84	155.00	62.00	400	1983-84	2106.00	1425.00	677
1984-85	221.00	92.00	416	1984-85	2076.00	1302.00	627
1985-86	191.00	61.00	319	1985-86	2282.00	1557.00	682
1986-87	230.00	89.00	387	1986-87	2218.00	1481.00	668
1987-88	245.00	103.00	420	1987-88	2240.00	1471.00	657
1988-89	188.00	61.70	328	1988-89	2237.00	1566.80	700
1989-90	224.00	74.60	333	1989-90	2157.00	1426.80	661
1990-91	230.00	68.50	298	1990-91	2462.00	1891.90	768
1991-92	196.00	77.00	393	1991-92	2138.00	1715.00	802
1992-93	210.00	74.00	352	1992-93	2346.00	1758.00	749
1993-94	290.00	132.00	455	1993-94	2342.00	1954.00	834
1994-95	441.00	222.00	503	1994-95	2741.00	2487.00	907
1995-96	293.00	142.00	485	1995-96	2660.00	1988.00	747
1996-97	348.00	193.90	557	1996-97	2513.00	2293.30	913
1997-98	337.20	115.00	341	1997-98	2582.50	2440.90	945
1998-99	355.30	202.50	570	1998-99	2665.40	2463.40	924
99-2000	319.40	175.30	549	99-2000	2571.90	2535.10	986
2000-01	369.50	239.40	648	2000-01	1978.40	1620.30	819
2001-02	479.70	281.60	587	2001-02	2553.90	2408.20	943
2002-03	479.80	251.90	525	2002-03	2470.60	1713.40	694
2003-04	509.50	171.10	336	2003-04	2791.30	2584.90	926
2004-05	418.00	224.00	536	2004-05	2746.50	2548.90	928
2005-06	418.00	229.00	548	2005-06	2560.70	2371.20	926
2006-07	651.00	308.00	473	2006-07	2462.80	2413.00	980
2007-08	605.00	367.00	607	2007-08	2438.70	1735.00	711
2008-09	730.00	400.00	552	2008-09	2840.00	2790.00	981
2009-10	970.00	570.00	591	2009-10	3090.00	3300.00	1071
2010-11	960.00	630.00	656	2010-11	3110.00	2690.00	865
2011-12	800.00	380.00	473	2011-12	3040.00	3290.00	1081
2012-13	1025.00	652.00	636	2012-13	3128.70	3551.20	1135
2013-14	946.00	716.00	757	2013-14	3160.10	3299.1	1044
2014-15	939.00	674.00	718	2014-15	2853.00	2964.00	1039
2015-16	1420.00	662.29	466	2015-16	3017.00	3364.00	1115
2016-17	1003.00	592.00	590	2016-17	3222.00	3544.20	1100
2017-18	1265.00	783.04	619	2017-18	3590.00	4595.02	1280
2018-19	1129.00	574.00	509	2018-19	3103.00	3997.00	1288
2019-20	864.00	675.65	782	2019-20	1926.00	2729.14	1417
2020-21	713.00	445.63	625	2020-21	2160.00	3214.08	1488

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Maharashtra			Year	Punjab		
	A	P	Y		A	P	Y
1971-72	433.00	133.00	307	1971-72	335.00	282.00	842
1972-73	242.00	41.00	169	1972-73	319.00	267.00	837
1973-74	393.00	148.00	377	1973-74	352.00	315.00	895
1974-75	412.00	141.00	342	1974-75	266.00	216.00	812
1975-76	456.00	185.00	406	1975-76	381.00	376.00	987
1976-77	428.00	135.00	315	1976-77	349.00	311.00	891
1977-78	472.00	147.00	311	1977-78	353.00	322.00	912
1978-79	460.00	157.00	341	1978-79	351.00	284.00	809
1979-80	453.00	173.00	382	1979-80	236.00	162.00	686
1980-81	429.00	150.00	350	1980-81	258.00	150.00	581
1981-82	461.00	177.00	384	1981-82	243.00	115.00	473
1982-83	437.00	148.00	339	1982-83	124.00	62.00	500
1983-84	495.00	212.00	428	1983-84	97.00	58.00	598
1984-85	509.00	202.00	397	1984-85	102.00	60.00	588
1985-86	534.00	176.00	330	1985-86	108.00	98.00	907
1986-87	482.00	129.00	268	1986-87	114.00	82.00	719
1987-88	560.00	229.00	409	1987-88	57.00	29.00	509
1988-89	667.00	407.70	611	1988-89	73.00	72.10	988
1989-90	627.00	334.60	534	1989-90	54.00	38.70	717
1990-91	673.00	357.80	532	1990-91	61.00	45.20	741
1991-92	434.00	206.00	475	1991-92	25.00	18.00	720
1992-93	591.00	302.00	511	1992-93	27.00	18.00	667
1993-94	681.00	493.00	724	1993-94	20.00	16.00	800
1994-95	763.00	469.00	615	1994-95	19.00	19.00	1000
1995-96	717.00	376.00	524	1995-96	20.00	17.00	850
1996-97	750.00	498.40	665	1996-97	16.00	14.40	900
1997-98	718.00	291.00	405	1997-98	13.00	11.00	846
1998-99	904.20	561.90	621	1998-99	13.20	10.40	788
99-2000	932.00	600.00	644	99-2000	6.30	6.10	968
2000-01	676.00	351.00	519	2000-01	7.70	7.30	948
2001-02	756.00	450.00	595	2001-02	7.10	6.20	873
2002-03	796.00	449.00	564	2002-03	7.00	6.70	957
2003-04	795.00	421.00	530	2003-04	6.00	5.40	900
2004-05	830.00	466.00	561	2004-05	5.10	4.40	863
2005-06	1020.00	705.00	691	2005-06	4.00	3.00	750
2006-07	1308.00	924.00	706	2006-07	3.80	3.80	1000
2007-08	1353.00	1116.00	825	2007-08	2.80	2.80	1000
2008-09	1140.00	770.00	677	2008-09	2.90	3.40	1172
2009-10	1290.00	1110.00	863	2009-10	3.00	3.40	1133
2010-11	1440.00	1300.00	903	2010-11	3.10	3.80	1226
2011-12	1050.00	820.00	775	2011-12	2.00	2.60	1300
2012-13	1254.00	1058.00	844	2012-13	2.00	2.80	1400
2013-14	1820.00	1622.00	891	2013-14	1.90	2.30	1211
2014-15	1427.00	1088.00	762	2014-15	1.80	1.90	1056
2015-16	1442.00	777.00	539	2015-16	1.70	2.20	1294
2016-17	1929.30	1719.01	891	2016-17	1.60	2.20	1375
2017-18	2000.30	1834.28	917	2017-18	1.70	2.01	1181
2018-19	1694.00	1397.00	825	2018-19	2.00	3.00	1330
2019-20	2043.21	2239.36	1096	2019-20	1.50	1.83	1219
2020-21	2231.30	2396.42	1074	2020-21	2.00	2.64	1322

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Rajasthan			Year	Uttar Pradesh		
	A	P	Y		A	P	Y
1971-72	1642.00	885.00	539	1971-72	1989.00	4566.00	2296
1972-73	1204.00	803.00	667	1972-73	1920.00	1461.00	761
1973-74	1500.00	715.00	477	1973-74	1956.00	1044.00	534
1974-75	1425.00	796.00	559	1974-75	1721.00	1010.00	587
1975-76	1952.00	1498.00	767	1975-76	1726.00	1250.00	724
1976-77	1776.00	1361.00	766	1976-77	1659.00	1362.00	821
1977-78	1862.00	1488.00	799	1977-78	1656.00	1207.00	729
1978-79	1748.00	1589.00	909	1978-79	1641.00	1228.00	748
1979-80	1378.00	750.00	544	1979-80	1554.00	693.00	446
1980-81	1225.00	854.00	697	1980-81	1496.00	1288.00	861
1981-82	1935.00	1257.00	650	1981-82	1571.00	1061.00	675
1982-83	1756.00	1318.00	751	1982-83	1506.00	1395.00	926
1983-84	1796.00	1089.00	606	1983-84	1358.00	1186.00	873
1984-85	1533.00	969.00	632	1984-85	1374.00	1272.00	926
1985-86	1941.00	1623.00	836	1985-86	1535.00	1327.00	864
1986-87	1412.00	824.00	584	1986-87	1492.00	1233.00	826
1987-88	684.00	411.00	601	1987-88	1418.00	1069.00	754
1988-89	1282.00	967.00	754	1988-89	1325.00	1167.20	881
1989-90	1144.00	711.40	622	1989-90	1304.00	969.00	743
1990-91	1653.00	1011.00	612	1990-91	1275.00	1121.60	880
1991-92	1029.00	679.00	660	1991-92	1105.00	943.00	853
1992-93	1449.00	794.00	548	1992-93	1065.00	951.00	893
1993-94	1222.00	747.00	611	1993-94	1013.00	931.00	919
1994-95	1587.00	1371.00	864	1994-95	1037.00	948.00	914
1995-96	1620.00	1090.00	673	1995-96	1006.00	698.00	694
1996-97	1519.00	1071.00	705	1996-97	917.00	852.40	930
1997-98	2213.90	1924.60	869	1997-98	881.80	746.50	847
1998-99	2815.70	2073.80	737	1998-99	896.50	772.90	862
99-2000	975.30	677.90	695	99-2000	822.30	779.30	948
2000-01	672.60	396.60	590	2000-01	833.00	702.70	844
2001-02	969.60	735.50	759	2001-02	841.00	817.00	971
2002-03	449.70	340.60	757	2002-03	872.50	779.10	893
2003-04	1117.50	707.20	633	2003-04	760.60	787.10	1035
2004-05	1035.20	773.00	747	2004-05	738.60	672.20	910
2005-06	1081.90	478.90	443	2005-06	739.60	660.60	893
2006-07	1010.80	872.60	863	2006-07	675.00	501.00	742
2007-08	1231.30	574.20	466	2007-08	505.00	376.00	745
2008-09	1260.00	980.00	779	2008-09	550.00	560.00	1014
2009-10	880.00	530.00	604	2009-10	620.00	510.00	824
2010-11	1780.00	1600.00	899	2010-11	570.00	530.00	930
2011-12	1430.00	990.00	691	2011-12	580.00	720.00	1248
2012-13	1252.00	1265.20	1010	2012-13	604.00	732.00	1212
2013-14	1923.50	1640.40	853	2013-14	577.00	475.4	824
2014-15	1256.30	911.10	725	2014-15	558.00	367.70	659
2015-16	941.95	840.34	892	2015-16	268.00	164.00	612
2016-17	1547.91	1409.39	911	2016-17	562.00	626.00	1114
2017-18	1572.49	1688.85	1074	2017-18	501.00	578.66	1155
2018-19	1597.00	1839.00	1152	2018-19	572.00	728.00	1272
2019-20	2463.05	2657.63	1079	2019-20	621.00	851.39	1371
2020-21	2113.14	2265.29	1072	2020-21	611.00	759.47	1243

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Jharkhand			Year	Chhattisgarh		
	A	P	Y		A	P	Y
2000-01				2000-01	140.10	72.10	515
2001-02				2001-02	169.50	124.60	735
2002-03				2002-03	175.60	113.10	644
2003-04				2003-04	204.70	197.30	964
2004-05				2004-05	210.50	114.10	542
2005-06	30.20	24.50	811	2005-06	231.50	163.40	706
2006-07	76.70	70.80	923	2006-07	213.70	180.20	843
2007-08	74.70	69.10	925	2007-08	235.50	205.80	874
2008-09	89.50	80.30	897	2008-09	239.70	199.20	831
2009-10	63.00	57.60	914	2009-10	252.20	221.90	880
2010-11	65.00	52.00	800	2010-11	252.00	242.00	952
2011-12	149.50	154.80	1036	2011-12	241.60	240.40	945
2012-13	132.00	169.00	1281	2012-13	266.80	285.20	1069
2013-14	155.8	181.7	1166	2013-14	276.5	213.2	771
2014-15	160.70	186.40	1160	2014-15	280.60	290.4	1035
2015-16	164.07	163.21	995	2015-16	303.20	219.00	722
2016-17	210.74	247.41	1174	2016-17	307.40	359.90	1171
2017-18	232.68	285.74	1228	2017-18	317.75	320.93	1010
2018-19	190.00	221.00	1166	2018-19	322.00	330.00	1026
2019-20	230.07	275.40	1197	2019-20	381.77	88.19	231
2020-21	265.90	334.24	1257	2020-21	302.59	267.51	887

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	Odisha			Year	Telangana		
	A	P	Y		A	P	Y
2010-11	41.9	32.7	780	2010-11	109.0	148.2	1360
2011-12	39.0	29.8	764	2011-12	85.0	72.0	847
2012-13	41.2	31.9	774	2012-13	112.0	164.0	1464
2013-14	47.15	36.21	768	2013-14	113.94	246.34	2162
2014-15	47.25	36.38	770	2014-15	59.04	81.00	1372
2015-16	39.18	30.13	769	2015-16	70.00	50.00	714
2016-17	40.32	30.97	768	2016-17	102.00	132.00	1294
2017-18	32.94	25.63	778	2017-18	97.00	147.05	1516
2018-19	30.57	23.84	780	2018-19	104.00	163.00	1569
2019-20	27.82	21.67	779	2019-20	130.00	199.16	1532
2020-21	29.19	22.56	773	2020-21	143.00	238.38	1667

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Year	West Bengal		
	A	P	Y
2010-11	22.1	23.7	1072
2011-12	23.3	24.4	1049
2012-13	25.1	29.6	1175
2013-14	24.90	29.27	1175
2014-15	26.18	30.84	1178
2015-16	30.79	36.70	1192
2016-17	28.12	28.50	1013
2017-18	32.00	36.80	1150
2018-19	35.91	42.33	1179
2019-20	36.10	47.40	1313
2020-21	39.77	50.07	1259

A : Area (thousand ha)

P : Production (thousand tones)

Y : Yield (Kg/ha)

Centrally released varieties of chickpea in India

S. No.	Variety	Year of release	Originating centre	Salient features	Yield (q/ha)	Days to maturity	Parentage	Area of adoption	Special features
1.	Chaffa	1948	Junagadh	Early maturing, yellowish brown and medium Large Seeds (16-19 g/100 seeds)	10-11	105-110	Selection from Niphad (MS)	Maharashtra & Gujarat	Rainfed
2.	C 235	1960	Ludhiana	Medium tall, semi erect. Seeds round, small (13g/100 seeds), wrinkled and brownish yellow	20	160-170	IP 58 X C 1234	Punjab & Haryana	Rainfed
3.	Dahod Yellow	1960	Junagadh	Seeds are yellowish brown and medium in size (15 g/100 seeds)	17-20	120-130	Selection from Local Germplasm	Gujarat	Rainfed
4.	JG 62	1972	Jabalpur	Seeds are yellowish brown and medium in size (15 g/100 seeds)	19	120-125	Local Bulk Selection	Jabalpur	Rainfed
5.	H 208	1977	Hisar	Medium tall, semi erect, seeds round, small wrinkled and brownish in color (15 g/100 seeds)	19-20	130-135	(S 26 x G 24) x C 235	Punjab, Haryana & Western U.P.	Rainfed
6.	H 355	1977	Hisar	Tall, semi-erect, late maturing, seeds small (13 g/100 seeds), round, wrinkled & brownish yellow	19	160	G 140 x S 26	Madhya Pradesh	Irrigated & Rainfed
7.	L 550 (K)	1977	Ludhiana	Plants are medium tall and bushy. Seeds are small and creamy white	18	130-135	PB 7 x Rabat	Whole country except southern state	Irrigated
8.	Pusa 203	1977	IARI, New Delhi	Seeds are yellowish brown and small (13 g/100 seeds)	22	135	P 827 x C 235	NEPZ, NWPZ	Suitable for North plain
9.	Pusa 209	1980	IARI, New Delhi	Semi spreading, leaflets narrow, linear, green colour, Primary & Secondary branches medium in thickness	20-22	120-130	P 827 (Exotic) x C 235 (Indian)	Rajasthan, Delhi, eastern U.P. & Bihar	Rainfed
10.	Pant G 114	1981	Pantnagar	Semi erect, stem & foliage green colour, pod medium in size, 1-2 seeded., seeds brown, small (13g/100 seeds) & wrinkled	22	145-150	G 130 x G 1540	NWPZ, NEPZ	Rainfed
11.	GNG 16	1982	Sriganga nagar	Tall plant type, semi spreading, small seeded (13g/100 seeds) double flowered, dark green canopy, two podded	22	160	S 26 x GNR 14	NWPZ	Rainfed
12.	JG 74	1983	Jabalpur	Seed coat coarse medium in size (18g/100 seed) and yellowish brown	11-13	110-115	Selection from composite genetic stock	Bihar, West Bengal & Eastern M.P.	Rainfed under Late sown condition
13.	Pusa 212 (BG 212)	1983	IARI, New Delhi	Semi-spreading, dark green leaves. Seeds are light brown oval shaped and small (13g/100 seeds)	16	138-150	P 340 x G 130	Rajasthan, Gujarat & MP	Irrigated
14.	Gaurav (H 75-35)	1984	Hisar	Medium tall erect, foliage dark green with broad leaves, pigmentation on leaf axils and Large seeded (20 g/100 seeds)	20-22	160-165	C 235 x E 100 Y	Haryana, Punjab, Rajasthan, Jammu, Western UP, Uttaranchal & Delhi	Rainfed
15.	GNG 146	1984	Sriganga nagar	Semi-erect with purple flowers and pigmentation present on primary branches. Seeds are greenish yellow and small (13.4 g/100 seeds)	22-24	140-145	Selection from unidentified material	NWPZ	Rainfed & Irrigated
16.	ICCC 32 (Kabuli)	1984	ICRISAT, Hyderabad	Seeds medium Large and creamy white (17g/100 seeds)	26	120-130	L 550 x L 2	Punjab, Haryana, UP, MP, Bihar & Jharkhand	Normal sown
17.	JG 315	1984	Jabalpur	Erect and medium tall. Seeds are angular, brown medium Large (16 g/100 seeds)	12-15	125-130	Selection from WR 315	Haryana, Punjab, MP, UP, Rajasthan, Jammu,	Rainfed

								Uttaranchal, Delhi, Gujarat & Maharashtra	
18.	Pusa 240	1984	IARI, New Delhi	Semi- spreading with small leaflets, 14g/100 seeds	16	135-150	H 208 x P 556	Haryana, Punjab, UP, Rajasthan, Jammu, Uttaranchal &Delhi	Rainfed &Irrigated
19.	Pusa 244	1985	IARI, New Delhi	Semi-spreading growth habit, seeds are medium bold (19g/100 seeds), light brown colour	15-16	110-120	(850-3/27 x P 922) x P 9847 - <i>Kabuli</i>	Haryana, Punjab, UP, Rajasthan, Jammu, Uttaranchal &Delhi	Rainfed &Irrigated
20.	Pusa 256	1985	IARI, New Delhi	Seeds are large (22 g/100 seeds) and light brown color.	18-20	135-140	(JG 62 x 850- 3/27) x (L 550 x H 208)	Haryana, Punjab, MP, WB, UP, Rajasthan, Jammu, Uttaranchal, Bihar, Maharashtra, Gujarat, &Delhi	Rainfed &Irrigated
21.	Pusa 261	1985	IARI, New Delhi	Tall plant height, erect, less no. of tertiary leaflet medium, long, ovate and light green colour, Seed golden colour, medium large (16g/100 seeds)	22	135	P 327 X P 9847	NWPZ	Late sown
22.	Pusa 408	1985	IARI, New Delhi	Semi erect, leaflet, narrow with light, green colour, profuse pod bearing , seed yellowish brown 2-3 grains/pod, medium large (13g/100 seeds)	22	135	Mutant of G130	NWPZ	Rainfed &Irrigated
23.	Pusa 413	1985	IARI, New Delhi	Semi erect, leaflet, narrow with light, green colour, profuse pod bearing , seed golden yellow medium large (13g/100 seeds), 2-3 grains/pod	19	135	Mutant of G130	UP, Bihar & WB	Rainfed
24.	Pusa 417	1985	IARI, New Delhi	Semi erect, profuse branch, leaflet, ovate and light green, seeds golden yellow, medium large (13g/100 seeds)	20	118	Mutant of variety of BG203	Gujarat, MP & Maharashtra	Rainfed
25.	Vishwas (Phule G 5)	1985	Rahuri	Erect, pigmented stem, large numbers of effective root nodules. Seeds are smooth Large (27 g/100 seeds) and round	20-25	110-115	B 110 X N 31	CZ	Normal sown
26.	Pusa 267 (BG 267 <i>Kabuli</i>)	1988	IARI, New Delhi	Semi-erect, tall brown and seeds are medium large (21 g/100 seeds), salmon white	23	145-155	US 613 X BEG 482	Haryana, Delhi, UP, Punjab, Rajasthan, Jammu & Uttaranchal	Irrigated
27.	PBG 1	1988	Ludhiana	Tall, erect, seeds are brown and medium Large (17 g/100 seeds)	16-18	155-160	GG 578 X NEC 206	NWPZ	Rainfed &Irrigated
28.	Kranti (ICCV 37)	1989	ICRISAT, Hyderabad	Semi-erect, dwarf, bushy with light green and narrow leaves, seeds light brown and medium Large (18 g/100 seeds)	19-20	100-110	(P 481 X JG 62) X P1630	Central & South India, Peninsular India	Rainfed
29.	GPF 2 (GF 89- 36)	1990	ARS, Faridkot	Medium tall and semi-erect, seeds are medium large (17g/100 seeds).	21-23	152-155	GL 769 X H 75-35	NWPZ	Irrigated
30.	Haryana Chana 1 (H 82-2)	1990	Hisar	Dwarf & long fruiting branches. Seeds are small (13 g/100 seeds) and light brown color.	22	145-150	F 61 X L 550	NWPZ	Rainfed
31.	Bharti (ICCV 10)	1992	ICRISAT, Hyderabad	Semi-erect and early maturing, seeds are medium large 17 g/100 seeds	20	95-100	P 1231 X P1265	Central & South zone	Irrigated

32.	Udai (KPG 59)	1992	CSAU&T, Bharari	Medium Large seeded, semi-erect, medium tall, double seeded. Seed medium large (19g /100 seeds), smooth & light brown.	19-20	135-140	Radhey X K 468	NEPZ & NWPZ	Rainfed
33.	Pusa 329 (BG 329)	1993	IARI, New Delhi	Semi-erect and Large seeded (22 g/100 seeds) and brown.	20-22	145-155	(BG 203) X P 179	Punjab, Haryana, U.P. & Rajasthan	Rainfed
34.	Pusa 372 (BG 372)	1993	IARI, New Delhi	Semi-spreading. Seeds brown, small (14 g/100 seeds)	18-20	135-140	P 1231 X P 1265	NWPZ, NEPZ & CZ	Rainfed
35.	Vijay (Phule G 81-1-1)	1993	Rahuri	Spreading type growth habit. Seeds small (15 g/100 seeds) and brown	19-21	105-110	P 127 X Annegeri 1	NWPZ, NEPZ & CZ	Rainfed
36.	Vardan (GNG 663)	1994	Sriganga nagar	Semi-spreading, semi-erect, medium dark brown seeds and medium Large (17 g/100 seeds). Zigzag branching pattern	22-25	150-155	GNG 16 X GNG 146	NWPZ	Rainfed
37.	Pusa 362 (BG 362)	1995	IARI, New Delhi	Medium tall with brown and Large seeded (23 g/100 seeds)	23-24	145-150	BG 303 X P 179	NWPZ	Rainfed
38.	KWR 108	1996	CSAU&T, Kanpur	Medium tall, semi-erect with brown and medium Large seed (17 g/100 seeds)	20-23	130-135	Selection from genetic stock P 108	NEPZ	Rainfed
39.	Pusa 391 (BG 391)	1996	IARI, New Delhi	Medium tall and erect plant with dark brown and Large seeded (25 g/100 seeds)	20-25	110-120	ICC 3935 X Pusa 256	CZ	Rainfed & irrigated
40.	Samrat (GNG 469)	1996	Sriganga nagar	Erect, tall, semi-spreading, with brown and Large seed.	20-22	145-150	Annegeri1 X H 75-35	Rajasthan, Punjab & Haryana	Rainfed & irrigated
41.	Alok (KDG 1168)	1997	CSAU&T, Kanpur	Medium tall, semi-erect and medium Large seed (19 g/100 seeds)	19-21	140-150	Selection from K 158	NWPZ	Rainfed
42.	DCP 92-3	1998	IIPR, Kanpur	Semi-erect, medium tall, semi-spreading, yellowish brown & medium Large seed (17 g/100 seeds)	19-20	145-150	Selection from local Germplasm	NWPZ	Irrigated
43.	Karnal Chana 1 (CSG 8962)	1998	Karnal	Medium tall, semi-erect, small (15 g/100 seeds) and brown seeds.	20	150-160	Selection from GPF 7035	NWPZ	Rainfed
44.	Dharwad Pragati (BDG 72)	1999	IARI, New Delhi	Semi-erect, large podded, medium large & brown seeds (25 g/100 seeds)	18-20	115-120	(Pusa 256 x E 100 Ym) x Pusa 256	UP, MP, Gujarat, Maharastra, Rajasthan	Rainfed
45.	Gujarat Gram 1 (GCP 101)	1999	Junagadh	Semi-erect, medium tall, medium Large and dark brown seeds (18g/100 seeds)	18-20	115-120	GCP 2 x ICCV 2	CZ	Rainfed
46.	JG 11	1999	Jabalpur, Sehore & ICRISAT, Hyderabad	Semi-spreading, pubescent, large pod, seed large (22 g/100 seeds) smooth & brown color.	15-16	95-100	[(Phule G 5 x Narsinghpur bold) x ICCX 37] ICCX-860263-BF-BP-91 BP	SZ	Irrigated & Rainfed
47.	PKV <i>Kabuli</i> 2 (KAK 2)	1999	Akola	Semi-spreading, medium tall, Large (38 g/100 seeds) & white.	17-18	90-115	(ICCC 2 x Surutato 77) x ICC 7344-ICCX 870026-PB-PB-14P-BP-62AK-7AK-BAK	UP, MP, Gujarat, Maharashtra & Rajasthan	Normal sown irrigated
48.	Pusa <i>Kabuli</i> 1003 (BG 1003)	1999	IARI, New Delhi	White and Large seeded (24 g/100 seeds) <i>Kabuli</i> with medium tall stature.	18	130-140	Mutant of L532	UP, Bihar, Jharkhand, WB & Assam	Irrigated
49.	Gujarat Gram 4 (GCP 105)	2000	Junagadh	Medium tall, semi-erect, pinkish flower smooth, round, medium large (17g/100 seeds) and brown seed	18-20	120-130	ICCL 84224 x Annegeri 1	NEPZ	Irrigated & Rainfed
50.	JG 16 (SAKI 9516)	2000	Sehore, Akola & ICRISAT, Hyderabad	Seed light brown, semi spreading with profuse branching, foliage dark green, medium seed size (19 g/100 seeds)	20	110-140	ICCC 4 x ICCV 10	UP, MP, Gujarat, Maharashtra & Rajasthan	Normal sown
51.	PusaChamatkar	2000	IARI, New	Tall, semi-erect type	17-19	145-150	ICCV 3 x FLIP	NWPZ &	Normal sown

	(BG 1053)		Delhi	<i>Kabuli</i> . Seeds are white and Large (27 g/100 seeds)			88-20	Central India	& irrigated
52.	Jawahar Gram <i>Kabuli</i> 1	2002	Jabalpur	Large seeded <i>Kabuli</i> (38 g/100 seeds) semi-spreading, early maturing.	15-18	100-110	(ICCV 2 x Surutato) x ICC 7344	CZ	Rainfed & Irrigated
53.	RSG 888 (Anubhav)	2002	Durgapura	Semi-spreading, double podded small seeded (14 g/100 seeds)	21	130-135	RSG 44 x E 100 Y	NWPZ	Rainfed
54.	Vihar (Phule G 95311)	2002	Rahuri	Seed Large (36 g/100 seeds) wrinkled, cream and suitable for mild and short winter season	22-24	90	(ICCC 32 x ICCL 80004) x (ICCC 49 x FLIP 82-886) x ICCV 3	SZ	Irrigated & Rainfed
55.	Anvita (RSG 931)	2004	Durgapura	Double podded, high yielding, semi-erect with profuse branching	20	135	RSG 44 x RSG 524	NWPZ	Rainfed
56.	Aadhar (RSG 963)	2005	Durgapura	Semi-erect and medium Large seed (17 g/100 seeds)	19-20	130-135	RSG 524 x PDG 84-10	Haryana, Punjab, Delhi, UP, Rajasthan, Jammu & Uttaranchal	Rainfed
57.	HK 2 (HK 94-134)	2005	Hisar	Erect plant growth habit, tall, seeds are creamy white & Large (26 g/100 seeds)	18-20	120-125	(H 82-5 x E100 Ym) x Bheema	NEPZ	Irrigated
58.	Pusa 547 (BGM 547)	2006	IARI, New Delhi	Seeds are Large (23 g/100 seeds)	17	120-140	Mutant of BG 256	NWPZ	Irrigated
59.	PusaShubhra (BDG 128)	2006	IARI, New Delhi	Semi erect, with light green foliage, seed colour beige, large (28 g/100 seeds)	18	120	ICCV 2 x ICCV 5	CZ	Irrigated
60.	Rajas (Phule G 9425-9)	2006	Rahuri	Semi erect, profuse branches, seeds are yellowish brown medium large (23 g/100 seeds)	19	145	Phule G 91028 x Bheema	NWPZ	Irrigated
61.	JAKI 9218	1997	ICRISAT, Hyderabad	Medium large seeded (18 g/100 seeds) variety	18-20	120	(ICCV 37 x GW 5/7) x ICCV 107	CZ	Rainfed
62.	Ganguar (GNG 1581)	2007	Sriganga nagar	Medium plant height, semi erect,	24	151	GPF 2 x H 82-2	NWPZ	Normal sown & irrigated
63.	IPCK 2002-29	2009	IIPR, Kanpur	Erect with light green foliage, large (33 g/100 seed) white seed	22	107	L 144 x H 82-2	CZ	Irrigated
64.	IPCK 2004-29	2009	IIPR, Kanpur	Erect plant, light green, bold white seed	20	108	[(ICCV 2 x ICCV 88507) x ICCV 42] x ICC 7344	CZ	Irrigated
65.	Phule G 0517	2009	Rahuri	Semi spreading, broad leaves, ivory white extra large seed	18	110	Selection from local germplasm	M.S., M.P., & Karnataka	Irrigated
66.	PKV <i>Kabuli</i> 4	2009	Akola	Semi spreading, broad leaves, ceramic white extra large seed	20	110	Selection from local germplasm	M.S. & M.P.	Irrigated
67.	MNK 1	2011	Gulbarga	Erect plant, seeds are milky white, extra large (52 g/100 seeds)	13	100	Selection from local germplasm	SZ	Irrigated
68.	HK 05-169 (HK 4)	2012	Hisar	Seeds size is large (28.4g/100 seeds) and of white colour. It showed resistance to moderately resistance reaction against wilt.	16.0	125	HK 92-94 x HK-1	NEPZ	Irrigated
69.	JSC 55 (RVG 202)	2012	Sehore	Suitable for planting under late sown condition It showed resistant reaction against wilt and moderately resistance reaction against dry root rot and collar rot.	20.0	102	(JAKI 9226 x DCP 20) X JC 412	CZ	Late sown
70.	JSC 56 (RVG 203)	2012	Sehore	Suitable for planting under irrigated and late sown conditions. It is mod. resistant against wilt and dry root rot.	19.0	100	(ICCV 91902 x ICCV 10) x ICCV 89230	CZ	Irrigated Late sown
71.	CSJK 6	2012	Durgapura	Suitable for normal sown irrigated condition. It possesses dull white seed colour with 32.8 g/100 seeds. It matures in 188 days.	11.0	188	RSGK 628 x BG 1053	NHZ	Irrigated

72.	GLK 26155 (L 555)	2012	Ludhiana	Suitable for timely planting under irrigated condition. It has light yellow or creamy seed colour with 27.8 g average 100-seed weight. It matures in 146 days.	22.8	146	BG 1088 x MPJG 2	NWPZ	Irrigated
73.	Phule G 0027	2012	Rahuri	Suitable for normal sown irrigated condition. It has attractive white seed colour.	14.0	196	[(ICCV 95412 x Phule G 92307) x ICCV 95412]	NHZ	Irrigated
74.	GNG 1958	2013	Sriganga nagar	Suitable for normal sown irrigated condition. It matures in 145 days. It has brown seed colour with 25.4 g average 100-seed weight.	26.8	145	GNG 1365 x SAKI 9516	NWPZ	Irrigated
75.	GNG 1969	2013	Sriganga nagar	Suitable for normal sown irrigated condition. It possesses creamy beige seed colour with 26.2 g/100 seeds.	22.0	146	IPCK 96-3 x GNG 1382	NWPZ	Irrigated
76.	GLK 28127	2013	Ludhiana	Large seeds (36.0 g/100 seeds), light yellow or creamy colour with irregular owl head.	21.0	149	GLK 88016 x FLIP 88-34C	NWPZ	Irrigated
77.	Pusa 3022 (BG 3022)	2015	IARI	Large seeded (35.7 g/100 seeds) <i>kabuli</i> chickpea with attractive beige coloured seed.	18.00	150	(BG 1048 x BG 1083) x SBD 377	NWPZ	Irrigated
78.	Vallabh <i>Kabuli</i> Channa-1 (WCGK-2000-16)	2015	Modipuram	Large seeds (27.5 g/100 seeds), white beige colour, moderately resistant to Fusarium wilt.	23.0	147	L 550 x ICCV 2	NWPZ	Irrigated
79.	GNG 2144	2016	Sriganga nagar	Desi type chickpea with medium bold seeds (15.9g/100 seeds). It has tolerance to fusarium wilt disease.	22.8	133	CSJD 901 X CSG 8962.	NWPZ	Irrigated late sown
80.	NBeG 119	2016	Nandyal	Large seeded (38.8 g/100 seeds) <i>kabuli</i> variety.	18.8	90-95	(ICCV 98502 X ICCV 98004) X ICCV 92311	SZ	Irrigated and rainfed
81.	CSJ 515	2016	Durgapura	Small brown colour seeds (17.0 g/100 seeds), mod. resistant to dry root rot, wilt & collar rot and tolerant to Ascochyta blight and BGM.	24.0	135	FG 712 x CSJ 146	NWPZ	Irrigated
82.	GJG 0809	2017	Junagadh	Medium brown colour attractive seed (21.5 g/100Seeds), mod. resistant to wilt & stunt, root rot & tolerant to Ascochyta blight.	16.0	157	GJG 9707 x IPC 97-7	NHZ	Irrigated
83.	GNG 2171	2017	Sriganga nagar	Yellow coloured seed of size 15.9 gm/100 seed; tolerant to fusarium wilt disease	20.14	163	GNG 663 X BG 1044	NWPZ	Irrigated
84.	Pant Gram 5	2017	Pantnagar	Brown coloured seed of size 16.2 gm/100 seed; tolerant to fusarium wilt disease	22.15	126-140	PG035 X HC5	NWPZ	Late sown
85.	BG 3043	2018	IARI	Desi variety with medium large (21.4 g/100 seeds) seed.	16.04	127-134	DG 5016 x FLIP 94-509C	NEPZ	Timely sown
86.	GNG 2207	2018	Sriganganagar	Desi variety with medium seed (17.4g/100 seed), tolerant to fusarium wilt disease	16-17	130	C 235 x SAKI 9516	NEPZ	Timely Sown
87.	Phule G 0405	2019	Rahuri	Desi variety with yellow brown, medium bold seed (19.9g/100 seed).	20-21	105-110	Digvijay x WCG 2000-2	WCZ	Timely Sown
88.	Purva GNG 2299	2019	Sriganganagar	Semi erect, profuse branching attractive seed size 15.9gm/100 seed, tolerant to wilt	15	116	HC 5 x GNG 1581	NEPZ	Late sown
89.	IPC 2006-77	2019	IIPR, Kanpur	Semi erect, early maturing,	20-22	112	DCP 92-3 x	ECZ	Late sown,

				attractive, seed size 15.6 gm/100seed MR to Wilt			T 39-1		High Seed Protein content (24.63%)
90.	Pusa Chickpea 10216	2020	IARI, New Delhi	Drought tolerant dise variety with seed size of 23.2 g/100 seeds; moderate resistance against Wilt and DRR.	13.18	110	(BG 372 x ICC 4958) x 2* BG 372	CZ	Drought Tolerant introgression lines
91.	Pusa Parvati (BG 3062)	2020	IARI, New Delhi	Tall growth habit, medium bold, attractive, brown coloured seed with seed size of 23 g/100 seed, tolerant to wilt.	23.62	113	ICCV 10 x ICCL 87322	CZ	Suited to mechanical harvesting
92.	Haryana Chana No. 7 (H 12-55)	2020	Hisar	Profuse branching, yellow brown attractive seed size 14 g/100seed, tolerance to wilt.	26.36	128	HC 1 x H 00-216	NWPZ	Late sown
93.	SA -1 (Super Annigeri 1)	2020	Gulbarga	Semi erect plant type, Angular seed Shape with 18-20 g/100 seed weight and highly resistance to wilt.	18.35	104	(Annigeri 1 x WR 315) x 3* Annigeri-1	SZ & CZ	Wilt resistant introgression line
94.	Phule Vikram (Phule G 08108)	2020	Rahuri	Tall growth habit with erect plant type, brown colour medium bold seed weighing 21.6 g/ 100 seeds, resistance to Fusarium wilt,	22.94	113	ICCV 10 x ICCL 87322	CZ	Suited to Mech. Harvesting
95.	Jawahar Gram 24 (JG 2016-24)	2020	Jabalpur	Tall and erect growth habit, 100 seed weight: 29.3 gm, resistant against fusarium wilt	22.37	115	(JG74 x ICC4958)- 21	CZ	Suited to Mech. Harvesting
96.	JGK 6 (JGK 2017-32)	2021	Jabalpur	Extra large seeded (40-45 g / 100seeds weight), attractive beige colour <i>kabuli</i> seed, moderately resistant to wilt.	14-18	140-145	JGK 2 x ICCV95333	NWPZ	Timely Sown
97.	RVG 204 (RVSSG 8102)	2021	Sehore	Tall and semi erect growth habit, seed size is 23.4 g/100seeds, moderately resistant to wilt.	22.32	111	ICCV10 x ICCL87322	CZ	Suited to Mech. Harvesting
98.	RVKG 2020 (RVSIG 63)	2021	Sehore	Medium tall and semi spreading plant, white flower with no anthocyanin content in plants, smooth seed surface, cream owls head shape seeds and large seeded, 100 seed weight is 39.5 g, moderately resistant to wilt.	16.37	147	JSC 52 x RVKG 100	NWPZ	Timely Sown
99.	PBG 9 (GL 13001)	2021	Ludhiana	Medium tall , semi erect plant type with medium bold brown attractive seeds (25g/100 seeds), moderate resistant to wilt & DRR.	17.50	132	GL22044 x GL22021	NEPZ	Timely Sown
100.	Kota <i>Kabuli</i> Chana -2 (RK GK 13-499)	2021	Kota	Semi erect, medium tall, extra bold wrinkled cream colour seed, 100seed weight is 40.7g, mod. resistant to wilt	17.34	135-149	Phule G 517 x MPJGK 6	NWPZ	Timely Sown
101.	PDKV- Kanak (AKG1303)	2021	Akola	Tall semi erect growth habit, resistant to fusarium wilt, medium bold seeded (21.7g/100seeds)	24.81	108-111	SAKI-9516 x AKG70	WCZ	Timely Sown
102.	Pusa Chickpea 20211 (Pusa Chickpea Manav)	2021	ICAR-IARI New Delhi	Semi- erect plant type, profusely branching, with 100 seed weight 19.5g, highly resistant to fusarium wilt & MR to DRR, CR, and stunt	23.92	108	[(Pusa391)/(Pusa 391/WR315)-3]	CZ	Wilt resistant introgression line
103.	RG 2015-08 (Lochan Chana)	2021	Raipur	Semi- erect plant type, medium pod size, 100 seed weight is 22.6 g, Resistant to wilt.	22.28	100-110	PDE90-2E x JG67	ECZ	Timely Sown
104.	Nandyal Gram 810	2021	Nandyal	Semi spreading plant type, medium height, attractive pods with bold seeds, tolerant to wilt, seed	WCZ- 18.36 NWPZ - 15.26	WCZ- 110-115 NWPZ- 145-150	ICCV95311 x ICCV95333	WCZ & NWPZ	Timely Sown

				size is 41 g/100 seeds.					
105.	RLBGK 1 (RLB Chana <i>Kabuli</i> 1)	2021	Jhansi	Brownish green stem with light green foliage, medium large seeded attractive beige colour seed & 100 seed weight 36.0g, mod. resistance to wilt, DRR & CR	15.49	94-104	JGK 1 x ICCV95333	SZ	timely sown
106.	IPCK 13-163(Madhav) <i>Kabuli</i>	2021	ICAR-IIPR	Suitable for Irrigated; timely sown condition. 100 seed weight: 28.7 g; Protein content: 20.96%, resistant to wilt	19.71 NWPZ and 16.59 WCZ	130-158 days (147 day); NWPZ & 103-120 WCZ days	JGK1 x PG0517	NWPZ	Timely Sown
107.	IPC MAS-1(IPC L4-14)	2021	ICAR-IIPR	Suitable for Timely sown; rainfed condition. MABC derived improved drought tolerant introgression line in genetic background of DCP92-3 possessing “ <i>QTL hot spot</i> ” region for drought tolerance gene on linkage group 4 (LG4) 100 seed weight: 16.6 g Protein content: 18.1%.	16.64	128-133 days (131 day)	(DCP92-3 x ICC4958) * 3DCP92-3	NWPZ	Drought Tolerant introgression lines
108.	Pusa Chickpea 4005	2021	ICAR-IARI	Suitable for Rabi, timely sown and rainfed conditions; Tolerance to abiotic stresses: tolerant to drought. Quality traits: Protein content 17.17 %; Grain characteristics: Medium bold, yellowish brown seeds with seed size (100-seed wt. of 24.1g).	16.18	119 days	Pusa 362 x (Pusa 362 x ICC 4958)-6	NWPZ	Drought Tolerant introgression lines
109.	GJGK 1617(Gujarat <i>Kabuli</i> Gram 1)	2021	Junagadh	Suitable for Irrigated condition, moderate resistance against Wilt. A bold seeded line with beige colour attractive seeds with a protein content of 18.01%, 100 seed weight 42.2g.	13.83	144 days	ICC 14195-P3 x ICCV93337	NWPZ	Timely Sown
110.	IPCMB 19-3(Samriddhi)	2021	ICAR-IIPR	Suitable for Irrigated, timely sown condition, Desi-Wilt Resistant Introgression Line Fusarium wilt resistant introgression line (WRIL) of Pusa 256, possessing the Wilt resistance race 2 on LG 2, introgressed in Pusa 256 from Vijay through MABC. 100-seed weight: 24.15 g; protein content: 22.9%	20.81	106 days	(Pusa 256 x Vijay) x 3*Pusa 256	CZ	Wilt resistant introgression line
111.	RKGK 13-414 (Kota <i>Kabuli</i> Chana 3)	2021	Kota	Suitable for Timely sown, irrigated conditions, medium tall (65cm), semi erect, single white flowers, medium bold, cream, wrinkled seed, resistant to wilt. 100 seed weight: 27.26g.	17.80	110 - 115days	BG 10444 x BG1111	WCZ	Timely sown
112.	NBeG 857	2021	Nandyal	High yielding desi chickpea, attractive light brown-coloured seeds; average Yield :18.2q/ha;	18.20	95 days	ICC 12419 x JG11	SZ	Timely sown

				maturity: 90-105 days; 100 seed weight of 23.4g; protein content of 21.7%. tolerant to wilt.					
113.	RG 2016-134 (CG Akshya Chana)	2021	Raipur	Suitable for the cultivation under irrigated; timely sown condition, moderately resistant to wilt; protein content: 18.74 (%); 100-seed weight: 25.8g	16.78	94 days	ICCV03112 x ICCV 10	SZ	Timely sown
114.	CSJK 174 (Karan Kabuli- 4)	2021	Durgapura	Suitable for timely sown in prevalent cropping system. Attractive beige-coloured medium-large seeds (32.13 g/ 100 seed weight).	14.72	104 days	ICCV 2 x RSGK 6	SZ	Timely sown

State released varieties of chickpea in India

S. No.	Variety	Year of release	Originating centre	Salient features	Yield (q/ha)	Days to maturity	Parentage	Area of adoption	Special features
1.	RS 10	1951	Sriganga nagar	Semi-spreading, seed medium (16 g/100 seeds), wrinkled, brown colour.	14	135	Selection from indigenous stock	Ajmer & Kota	Rainfed
2.	CO 1	1953	Coimbatore	seeds brownish, yellow, wrinkled small (13 g/100 seeds)	09	100	Selection from germplasm	TamilNadu	Rainfed
3.	Gwalior 2	1956	Gwalior	Medium tall, stem & foliage green, Seed light brown and wrinkled small (15 g/100 seeds)	11-12	130-135	Selection from local germplasm	M.P.	Rainfed
4.	N 59	1956	Maharashtra	Spreading with full green stem and foliage. Pod large green, seeds of golden yellow colour, large (21 g/100 seeds)	11	110	K 607 x Chaffa	Maharashtra	Rainfed
5.	Ujjain 21	1956	M.P.	Semi-spreading , pod green, seeds yellowish brown with rough texture, puckered small (13 g/100 seeds)	12-13	110-115	Selection from local material	M.P.	Rainfed
6.	Ujjain 24	1956	M.P.	Seed light brown, medium Large (16 g/100 seeds) wrinkled	12-13	120-125	Selection from Chanderi local material	M.P.	Rainfed
7.	G 24	1958	Ludhiana	Pod medium size, foliage dark green, small seeds (10g/100 seeds), chocolate brown colour, wrinkled	11	165	Selection from local germplasm	Punjab, Haryana	Rainfed sandy area
8.	S 26	1958	Ludhiana	Seed bright yellow, wrinkled and small (14g/100 seeds)	13	135	Selection from local germplasm	Punjab	
9.	Type 3	1959	CSAU&T, Kanpur	Tall semi spreading, double seeded pod, seeds smooth, light, brown, round and large (22g/100 seeds)	22	165	197 x 195	U.P. & M.P.	Rainfed & Irrigated
10.	GNG 114	1967	Sriganga nagar	Double podded desi variety having zigzag branching	22	140	Selection from local germplasm	Rajasthan	Irrigated
11.	Radhey	1968	CSAU&T, Kanpur	Tall, semi spreading, foliage light green, double seeded pod, seeds smooth, light brown, round & large sized (24g/100 seeds)	20-25	150-155	197 x 76	Bundelkhand region	Rainfed
12.	RS 11	1968	Durgapura	Brown seeded, seed size medium	17	140	Mutant of RS 10	Rajasthan	Rainfed
13.	C 104	1970	Ludhiana	Tall with light green foliage, erect with large leaflet, large and white seed	10	165	Derivative of PB 7 x Rabat	Punjab	Irrigated
14.	C 214	1971	Ludhiana	Tall with light green foliage, erect with large leaflet, large and white seed	19	160	[(G 24 x IP 58) x G 24]	Punjab, Haryana	Rainfed
15.	G 130	1971	Ludhiana	Seed small (14g/100 seeds), wrinkled and yellowish	22	155	(708 x C 235)	Punjab	Irrigated

				brown colour					
16.	Hare Chhole 1	1973	Ludhiana	Tall plant, semi spreading, small seed (13g/100 seeds) and seed was wrinkled	12-13	165-170	S 26 x GG Bijapur	Punjab	Irrigated
17.	BR 78	1974	Dholi	Semi erect, bushy, twin podded dark green, rough surface, seeds green, medium (17g/100 seeds)	15	145	Selection from local germplasm	Bihar	Irrigated
18.	L 144	1976	Ludhiana	Tall, profused branching with large leaflet, seed large (35g/100 seeds), white round and smooth	18	155	Rabat x S 26	Haryana	Irrigated
19.	B 124	1977	West Bengal	seed size (18g/100 seeds)	22	145	N 31 x B 75	West Bengal	Irrigated
20.	Annegeri 1	1978	Gulbarga	Semi spreading, short duration, seeds yellowish brown, round with medium size (18g/100 seeds)	12-15	95-100	Local selection from germplasm	Karnataka	Rainfed
21.	G 543	1978	Ludhiana	Tall, semi spreading, foliage dark green and 1-2 seeds/pod, seeds yellowish brown, small seeds (13g/100 seeds), wrinkled	22	175	C 235 x C 168	Punjab	Irrigated
22.	Jyoti	1978	Hyderabad	Semi spreading, seeds yellowish brown, round smooth and small (17g/100 seeds)	11	115	Local pure line selection	Andhra Pradesh	Rainfed
23.	K 468	1978	CSAU&T, Kanpur	Tall, semi spreading, foliage light green, double seeded pod, seed yellowish brown small (13g/100 seeds)	22	155	Selection from germplasm	U.P.	Rainfed & Irrigated
24.	K 850	1978	CSAU&T, Kanpur	Medium tall, erect with dark greenish foliage. Seeds are reddish brown, round smooth and Large (24 g/100 seeds)	25-28	145-150	Banda local x Etah bold	U.P.	Irrigated
25.	BDN 9-3	1979	Badnapur	Early maturing. Seed light brown, medium Large (17 g/100 seeds)	10-12	95-100	Selection from local germplasm at Badnapur	Maharashtra	Rainfed
26.	CO 2	1979	Coimbatore	Erect, short plant with 2-4 branching, double podded, seed medium (12 g/100 seeds), shriveled, light brown, desi type.	12	100	Pure line selection from germplasm No. G 62-404	Tamil Nadu	Rainfed & Irrigated
27.	B 110	1980	West Bengal	Seeds light, large (17 g/100 seeds)	22	145	N 31 x B 75	M.P., West Bengal	Rainfed
28.	JG 221	1980	Jabalpur	Seed brown colour, medium (18 g/100 seeds) and wrinkled	18	120	Composite from genetic stock line	M.P.	Rainfed
29.	JG 5	1980	Jabalpur	Pink smooth seeds, non-pigmented stem, white flower and Large seeded (22 g/100 seeds)	16-17	135-140	Pink 2 x GC 654	M.P.	Rainfed
30.	Mahamaya 1 (B 108)	1980	West Bengal	Tall, Semi-erect and small seeded (14 g/100 seeds) and brown color	22-23	130-140	N 31 x B 75	West Bengal	Irrigated
31.	D 8	1982	Maharashtra	Short plant type, stem & foliage green with white flowers. Seed smooth, round, brown yellow colour, small (15 g/100 seeds)	13	145	Hyderabad derivative	Maharashtra	Rainfed
32.	GG 588	1982	Ludhiana	Short, semi spreading, seeds brown to dark colour only small (13 g/100 seeds) size	23	150	G 130 x G 549	Punjab	Irrigated & rainfed
33.	GL 769	1982	Ludhiana	Erect, tall, dark green and narrow leaves. Seeds are brownish and medium Large (17g/100 seeds)	18-20	160-165	H 233 x L 168	Punjab	Irrigated & rainfed
34.	N 31	1982	Maharashtra	Plant erect, green foliage, flower pink colour, pod large with pigmentation. Seeds brown, large (35 g/100 seeds)	15	110	Chaffa x M 546 W	Maharashtra	Rainfed
35.	Vikas (Phule G 1)	1982	Rahuri	Early maturing, bushy growth habit with golden yellow and medium large seeds (18 g/100 seeds) and rough seed	10-12	105-110	Kanpur 6 x AF 7-10	Maharashtra	Rainfed
36.	Gwalior 21	1983	Jabalpur	Bold seeded, brown with	12	105	Local	M.P.	Rainfed

				rough seed coat			selection		
37.	ICCC 4	1983	ICRISAT, Hyderabad	Semi-erect, tall with basal branching. Seeds are yellow to light brown and medium large (16 g/100 seed)	17-19	105-115	H 208 x T 3	Gujarat	Rainfed & Irrigated
38.	Kiran (RSG 2)	1983	Durgapura	Erect, tall, light purple flower. Seeds yellowish brown & small (15 g/100 seeds)	18	135	Mutant of RS 10	Rajasthan	Normal & late sown
39.	Mahamaya 2 (B 115)	1984	West Bengal	Semi-spreading with dark green leaves, seeds are wrinkled, brown and medium large (18 g/100 seeds)	20	130-140	N 31 x B 75	West Bengal	Early & late sown
40.	CO 3	1985	Coimbatore	Early type and medium large seeded (19 g/100 seeds)	10-11	85	Selection from germplasm obtained from Maharashtra	Tamil Nadu	Rainfed
41.	RAU 52	1985	Dholi	Medium tall and semi-erect with deep green foliage and profuse pod bearing habit. Seeds are dark brown and small (16 g/100 seeds)	15-20	140-145	ST 4 x RS 10	Bihar	Rainfed
42.	Avrodhi	1987	CSAUA&T, Kanpur	Semi-spreading, tall, brown and large seeded (20 g/100 seeds)	22-25	145-150	T 3 x K 315	U.P.	Irrigated
43.	SG 2	1987	Dholi	Double podded	21	145	[(E 100Y x P 436) x (L 550 x F 378)]	Bihar	Suited to Diara area of Bihar
44.	Gora Hisari (Kabuli)	1988	Hisar	Semi-erect, tall, large and white seeded (23 g/100 seeds)	15-16	120-135	L 144 x P 6613	Haryana	Irrigated
45.	Phule G 12	1990	Rahuri	Early maturing, semi-spreading, seed medium large (16 g/100 seeds)	12-13	96-100	GW 5/7 x Ceylon 2	Maharashtra	Rainfed
46.	RSG 44	1991	Durgapura	Medium tall, semi-erect, purple flower and double pods. Seeds medium large (16 g/100 seeds)	23	135-150	JG 62 x F 496	Rajasthan	Irrigated & Rainfed
47.	Sadabahar	1992	CSAUA&T, Kanpur	Tall, semi-spreading, pink flower, foliage yellowish green, green, medium size seed (16 g/100 seeds).	25	145-150	Hima x L 245	U.P.	Irrigated
48.	Sweta (ICCV 2 : Kabuli)	1993	ICRISAT, Hyderabad	Early maturing. Semi-spreading, with white large seeds (26 g/100 seeds)	13	80-90	[(K 850 x GW 5/6) x P 48) x (L 550 x Guamchil 2)]	Maharashtra & Andhra Pradesh	Rainfed & Irrigated
49.	Pragati (K 3256)	1994	CSAUA&T, Kanpur	Tall, spreading, light green foliage, white flower, double podded, seed white and large (25 g/100 seeds)	17-18	140-150	Selection from Cyprus local	U.P.	Irrigated
50.	JG 218	1995	Jabalpur	Semi-erect, dark green, early maturing, yellowish brown, smooth and medium-large seed (18 g/100 seeds)	15-18	115-120	ICCV 4 x P 1353	M.P.	Irrigated
51.	HirwaChaffa (AKGS 1)	1996	Akola	Semi-spreading, pink flowered, early maturing. Seed small and green (16 g/100 seeds)	15-17	105-110	Selection from local germplasm	Maharashtra	Irrigated
52.	Pant G 186 (PG 88-6)	1996	Pantnagar	Small seeded (15 g/100 seeds).	18	125-135	ILG 613 x Pant G 114	U.P.	Rainfed & Irrigated
53.	Sadbhawana (WCG 1)	1996	Modipuram	Semi-erect, pigmented leaf & stem and large seeded (26 g/100 seeds) Kabuli	20	135	Mutant of C 235	U.P.	Irrigated
54.	Vishal (Phule G 87207)	1996	Rahuri	Early maturing, semi-erect medium-large seeds (17 g/100 seeds)	20	110-115	K 850 x ICCL 80074	Maharashtra	Rainfed
55.	Gulabi Akola 1 (Gulak 1)	1997	Akola	Semi-spreading with white flower, seed gulabi, round large (26 g/100 seed)	12	115	Selection from local germplasm	Maharashtra	Rainfed & irrigated
56.	JAKI 9218	1997	ICRISAT, Hyderabad	Medium large seeded (18 g/100 seeds) variety	18-20	120	(ICCV 37 x GW 5/7) x	CZ	Rainfed

							ICCV 107		
57.	JG 322	1997	Jabalpur	Medium tall plant, seed medium Large (16 g/100 seeds) brown color and angular shape	15-18	110-115	Chaffa x BG 1	M.P.	Rainfed
58.	PBG 3 (GF 89-133/ GPF 133)	1997	PAU, Faridkot	Long fruiting branches, semi-erect, dark green foliage and medium-large seed (16 g/100 seeds) yellowish brown	16	160-165	GL 769 x GNG146	Punjab	Irrigated
59.	CO4	1998	Coimbatore	Early type, light pink flower, and large seed (19 g/100 seeds)	11-12	80-85	ICCC 42 x ICCV 12237	Tamil Nadu	Rainfed
60.	Gujarat Gram 2 (GCP 107)	1999	Junagadh	Medium tall, semi-erect and medium-large seed (18 g/100 seeds), dark brown color, smooth round surface	22-24	95-100	JG 1258 x BDN 9-3	Gujarat	Rainfed
61.	HC 3 (H 86-18)	1999	Hisar	Semi-erect, large seed (24 g/100 seeds), light brown colour	13-14	150-160	L 550 x E 100 Ym	Haryana	Irrigated
62.	JGG 1	1999	Jabalpur	Seeds are round, small (14 g/100 seeds), pink in color with slightly pointed peak and excellent parching quality	13-15	125-130	Selection from germplasm	M.P.	Irrigated
63.	L 551 (K)	1999	Ludhiana	Medium tall and bushy. Seeds medium Large(20 g/100 seeds).	18	155-160	ICC 32 x ICCX 760581 BRH-10H-BH	Punjab	Irrigated
64.	Pant G 10 (WCG 10)	1999	Pantnagar	Semi-erect, Large pods with brown seed color (16 g/100 seeds)	17-18	147	Mutant of G 130	U.P.	Rainfed & irrigated
65.	Surya (WCG 2)	1999	Pantnagar	Semi- erect, white flower, light green foliage, small seeds (13g/100 seeds) with yellowish brown colour	18-20	125-145	Mutant of G 130	U.P.	Irrigated
66.	PDG 4	2000	Ludhiana	Semi-erect, tall, dark green leaf, long fruiting branching, brown medium-large seed (17 g/100 seeds)	18	155	(GL 769 x GF 88421) x GF 8976	Punjab	Limited moisture condition
67.	Vaibhav (RSG 9218)	2000	Raipur	Semi-erect, tall and early maturing. Seed small (14 g/100 seeds) with wrinkled & shape attractive	18-19	120-130	Selection from GP ICCV 91106	Chhattisgarh & M.P.	Rainfed
68.	Virat (Phule G 95418)	2000	Rahuri	Semi-erect, large seeded (36 g/100 seeds), creamy, profuse branching.	18	90-100	(ICC-7676 x ICCV 32) x (ICCC 49 x FLIP-82-IC) x ICCV 3	Maharashtra	Rainfed
69.	GNG 1292 (K)	2002	Sriganga nagar	Semi spreading, profuse branching, medium large seed (22 g/100 seeds), round, whitish brown with uniform	24-26	130-150	Selection from (GNG 149) x (L 550 x L 2)	Rajasthan	Irrigated
70.	HK 1 (HK 89-131)	2002	Hisar	Semi spreading, medium tall, large seed (27 g/100 seeds) with round shape	17-18	150-155	(L 550 x E 100 Ym) x (ICCC 32 X ICC 820001)	Haryana	Irrigated
71.	JG 130	2002	Jabalpur	Semi spreading, with profuse branching, medium tall plant and brown large seed (24 g/100 seeds), smooth	18-20	115-120	(Phule G 5 x Narsinghpur bold) x JG 74	M.P.	Rainfed & Irrigated
72.	PBG 5	2002	Ludhiana	Semi-erect, seed small (15 g/100 seeds) and brown	19	160-165	BG 257 x Narsinghpur bold	Punjab	Irrigated & Rainfed
73.	Akash (CSJD 884)	2003	Durgapura	Semi-erect, double podded, medium large seed (16 g/100 seeds), reddish brown	16-17	125-135	RSG 44 x E 100 Y	Rajasthan	Rainfed
74.	Asar (RSGK 6)	2003	Durgapura	Early maturing, resistant to wilt	18	136	RSGK 628 x ICCV 2	Rajasthan	Irrigated
75.	Abha (RSG 973)	2004	Durgapura	High yielding, large seeded	16	125	RSG 515 x K 850	Rajasthan	Rainfed
76.	Anuradha (WBG 39/2)	2004	West Bengal	Seeds dark brown, wrinkled and semi erect plant type	24	126	Mahamaya 1 x Radhey	West Bengal	Rainfed
77.	HC 5 (HC 96-99)	2004	Hisar	Erect and deep rooted. Seed	20	135-140	H 89-78 x	Haryana	Rainfed

				(17 g/100 seeds).			H 89-84		&Irrigated
78.	JG 412	2004	Jabalpur	Semi-erect and Large seeded (25g/100 seeds)	19	95	Phule G 5 x Narsinghpur Bold) x ICCV 37	M.P.	Rainfed &Irrigated
79.	JG 63	2004	Jabalpur	Semi spreading with profused branching, yellowish brown seeds, medium	23	115	Single plant selection from JG 62	M.P.	Rainfed &Irrigated
80.	Pusa 1103	2004	IARI, New Delhi	Resistant to <i>Ascochyta</i> blight and tolerant to wilt	22	130	(Pusa 256 x Cicerreticulatum) x Pusa 362	Delhi/NCR	Irrigated
81.	Abhar (RSG 807)	2005	Durgapura	Widely adaptable, double podded, tolerant to <i>Ascochyta</i> & drought	18	140	BG 256 x RSG 44	Rajasthan	High input management
82.	Digvijay	2005	Rahuri	Semi spreading and large, yellowish brown seed	17	110	Phule G 91028 x Bheema	Maharashtra	Rainfed
83.	Pratap Chana 1	2005	Kota	Early maturing	13	90	ICC 10301 x ICC 1 (ICC 11522)	Rajasthan	Paddy-gram cropping system
84.	Pusa 1088	2005	IARI, New Delhi	large seed (26g/100 seeds)	23	140	(BG 256 x ICCV 32) x ICCV 32	Delhi	Moisture stress
85.	Pusa 1105	2005	IARI, New Delhi	Erect type plant, seeds medium large and brown colour (30 g/100 seeds)	19	145	(C 104 x BG 1003) x (ICC 88503 x BG 1048)	Delhi/NCR	Irrigated
86.	Arpita (RSG 895)	2006	Durgapura	High yielding with attractive seed colour	15	135	RSG 44 x RSG 255	Rajasthan	Rainfed
87.	Asha (RSG 945)	2006	Durgapura	Medium large seed, white flower, double podded (16g/100 seeds)	20	135	RSG 668 x RSG 817	Rajasthan	Rainfed
88.	JG 226	2006	Jabalpur	Medium height, spreading, good vegetative growth, small light brown, seed coat rough test wt. 15g, protein content 24.8%	21	115	JG 74 x JG 315	M.P.	Moisture stress
89.	JGK 2	2006	Jabalpur	Large seeded <i>kabuli</i> (34-36g /100 seed better looking quality)	18	100	(ICCV 32 x L 144) x ICC 49 x (FLIP 82-16C) x ICCV 3	M.P.	Irrigated
90.	JGK 3 (JSC 19)	2006	Jabalpur	Extra large seeded <i>kabuli</i> , tolerant to wilt for timely sown condition	15	115	ICCV 2 x BG 256	M.P.	Irrigated
91.	Lam Shanaya (LBeG 7)	2006	ANGRAU	Tolerant to wilt and rot condition	20-25	90	(ICCL 8001 x ICC 32) x (ICC 49 x FLIP 82-1C) x ICCV 3	M.P.	
92.	Pusa 1108	2006	IARI, New Delhi	Semi erect, broad leaf with light green and large seeded (29g/100 seeds)	29	150	[(BG 315 x ILC 72) x (ICCV 13 x FLIP 85-11)] x (ICCV 32 x Surutoto)	Delhi	
93.	Aparna (RSG 991)	2007	Durgapura	late sown conditions but also performs well under normal sown as well as rainfed conditions. It has good level of resistance to wilt and dry root rot	16	135	RSG 289 x BG 1053	Rajasthan	Rainfed
94.	Arpan (RSG 896)	2007	Durgapura	Broad leaf with double podded	14	135	RSG 44 x RSG 538	Rajasthan	Rainfed
95.	Aruna (RSG 902)	2007	Durgapura	Semi erect with profuse branching, double podded	20	135	RSG 44 x PDG 84-10	Rajasthan	Rainfed
96.	Gauri (GNG 1499: K)	2007	Sriganga nagar	Semi-erect with medium tall, large seed, beige (pale sandy fawn) colour	18	143	GNG 421 x BG 267	Rajasthan	Irrigated
97.	Sangam (GNG 1488)	2007	Sriganga nagar	Semi-erect with medium tall, seeds are brown with smooth surface	18	134	KPG 279-3 x GNG 469	Rajasthan	Late sown

98.	BDNG 797	2007	Badnapur	Desi variety resistant to wilt.	15-16	102	-	Maharashtra	
99.	Abhilasha (RSG 974)	2008	Durgapura	It is suitable for late sown situation and resistant to wilt, and tolerant to BGM & stunt	15	130	K 850 x RSG 515	Rajasthan	Rainfed
100.	Ankur (CSJ 140)	2008	Durgapura	It is suitable for irrigated situation and have good resistance to wilt and DRR	16	128	RSG 515 x K 850	Rajasthan	Irrigated
101.	Anshul (RSG 959)	2008	Durgapura	It is suitable for late sown and frost prone situation and shown resistance to wilt and DRR	15	130	RSG 581 x RSG 515	Rajasthan	Late sown
102.	JG 14	2008	Jabalpur	Heat tolerant variety suitable for late sown situation of M.P. It is resistant to wilt and has better milling quality	19	110	[(GW 5/7 x P 327) x ICCL 83149]	M.P.	Late sown
103.	JG 6	2008	Jabalpur	It is resistant to Fusarium wilt and moderately resistant to dry root rot	21	113	(ICCV 10 x K 850) x (H 208 x RS 11)	M.P.	Irrigated
104.	VallabhKallarChana 1 (WCG 3)	2008	Meerut	Suitable for cultivation in mild saline soils, and tolerant to wilt. Seed is medium bold with deep red pigmentation	19	135	Mutant of C 235	U.P.	Irrigated
105.	Pant <i>Kabuli</i> chana 1	2010	Pantnagar	Semi spreading, medium height, large seed with prominent beak, late maturing, Tolerant to BGM	14.0	125	Selection	Uttarakhand	Irrigated
106.	Gujarat Junagadh Gram 3	2010	Junagadh	Medium height, semi erect, yellow large seeded, early maturing, Resistant to wilt and stunt	15.0	110	ICCV 933001 x ICCV 10	Gujarat	Rainfed
107.	Raj Vijay <i>Kabuli</i> Gram 101	2011	Sehore	Large seeded <i>kabuli</i> , early maturing, Moderately resistant to wilt	20.0	110	ICCV 2 x BG 256	M.P.	Irrigated
108.	Raj Vijay Gram 201	2011	Sehore	Early maturing, <i>desi</i> type, Moderately resistant to wilt	25.0	105	PG 5 x Bheema	M.P.	Irrigated
109.	PKV Harita (AKG 9303-12)	2012	PDKV, Akola	Bold seeded, tolerant to wilt and drought, useful for culinary purpose	12-18	106-110	GREEN M UTANT 12 1-1 X AKG-46	Vidarbha region of Maharashtra	
110.	NBeG 3	2013	Nandyal	Large seeded <i>desi</i> variety (24.0g/100 seeds), tolerant to drought with good rooting quality, tolerant to wilt.	23.0	100	A 1 X ICC 4958	Andhra Pradesh	Irrigated
111.	JG 12	2014	Jabalpur	Desi variety with medium (15g/100 seeds) seed size. Semi-spreading habit with profuse pods.	20.0	110-120	(N. Bold x PG 5) x PG 5	M.P.	Rainfed
112.	PBG 7 (GL26054)	2015	Ludhiana	Desi variety with medium (16.1g/ 100 seeds) seed size. Tall variety with profuse podding	23-24	159	GPF2 x BG1084	Punjab	Irrigated
113.	Birsa Chana 3	2015	BAO, Jharkhand	Desi type, resistant to lodging, shattering, wilt disease and tolerant to gram pod borer	18-20	115-118	ICCV-2 x Bhawanipatna	Jharkhand	Normal sown condition
114.	Bidisha (BG 1084)(WBG 29)	2015	Berhampur, WB	Medium maturing <i>desi</i> variety with small seeds (12-14 g/ 100 seeds)	25.0	131	(Pusa 256 x GL 84038) x Pusa 267	WB	Normal and late sown condition
115.	JGK 5	2016	Jabalpur	Extra-large seeded (55-60 g/100 seeds) <i>kabuli</i> variety having resistance to <i>Fusarium</i> wilt and moderate resistance to root rot.	15-17	110-115	Selection from local germplasm from Malwa region	M.P.	Normal lown irrigated
116.	BDNGK 798	2016	ARS, Jalna	<i>Kabuli</i> type with white medium (29g /100 seeds) grains. Moderately resistant to wilt and stunt	16-18	120-135	BGD 2048 x ICC 118	Maharashtra	Irrigated
117.	Gujarat Junagadh Gram 6(GJG6)	2016	Junagadh	Tolerant to wilt and stunt, suitable for normal sowing.	16 -18	120-130	GJG 0105 x FC 711	Gujarat	Normal Sown
118.	JG 36 (Jawahar Gram 36)	2016	JNKVV, Jabalpur	Semi spreading plant with dark brown seed. Tolerant to wilt.	18 -20	110-120	JG 12 x JG 16	Madhya Pradesh	Rainfed and Irrigated
119.	GBM 2	2016	UAS, Raichur	Tall and erect plant type, suitable for mechanical	18 -20	100-110	Mutant of Annigeri 1	Karnataka	Irrigated

				harvesting					
120.	Indira Chana - 1	2017	IGKV, Raipur	Erect plant type with more primary branches, resistant to wilt	16	101-116	JG 74 x ICCL 83105	Chhattisgarh	Rainfed and Irrigated
121.	Nandyal Gram 49 (NBeG 49)	2017	ARS, Nandyal	Semi spreading plant type with medium height, Tolerant to wilt.	14-20	90-105	Annegiri x ICC 4958	Andhra Pradesh	Rainfed
122.	Pant Gram-4 (PG 065)	2017	GBPUAT, Pantnagar, Uttarakhand	Semi erect plant type, tolerant to wilt, BGM and dry root rot	18-20	126-162	PG 92-97 x C <i>reticulatum</i>	Uttarakhand	Rainfed and Irrigated
123.	Pant Gram-3 (PG 043)	2017	GBPUAT, Pantnagar, Uttarakhand	Semi erect plant type, medium seeds (24.4g/ 100 seeds), tolerant to wilt, BGM	18-24	139-152	K 850 (LM) x Avrodhi	Uttarakhand	Rainfed and Irrigated
124.	Pant <i>Kabuli</i> Gram-2 (PG071)	2017	GBPUAT, Pantnagar, Uttarakhand	Semi-erect plant type, <i>kabuli</i> variety (31.4g/ 100 seeds), tolerant to wilt, BGM	16-17	135-163	BG 1053 x PKC 1	Uttarakhand	Rainfed and Irrigated
125.	Dheera (NBeG 47)	2017	ARS, Nandyal	Semi-erect plan type, suitable for mechanical harvesting.	20-25	90-105	ICCV 2 x PDG 84-16	Andhra Pradesh	Suitable for Machine harvesting
126.	Phule Vikram	2017	MPKV, Rahuri	Semi-erect plan type, early maturing, suitable for mechanical harvesting.	16.37	105-110	ICCV 10 x ICCL 87322	Maharashtra	Suitable for Machine harvesting
127.	BGD 111-1	2018	IARI, Dharwad	Semi-spreading, medium bold seed (25g/100 seed).	16-17	95	(JG 62 x ICC 12237) x JG 62	Karnataka	Rainfed
128.	PDKV, Kanchan	2019	Akola	Profuse branching, semi spreading growth habit, medium bold seed size 19.7 g/100 seed early and synchronous maturity, resistance to wilt.	19.35	109	SAKI 9516 x FG 716	Maharashtra	Normal sown
129.	RVG 204	2019	Sehore	Tall and semi erect growth habit 100 seed wt. 28.4 g; resistant to wilt	20-25	111	ICCV 10 x ICCL 87322	M.P.	Mech. Harvesting
130.	RVS 205	2019	Sehore	Tall and semi erect plant type, dark green seed colour with 20 g/ 100 seed; resistance to Fusarium wilt	20-25	110-115	BGD 112 x JSC 37	M.P.	Normal /Rainfed
131.	RVKG 111	2019	Sehore	Smooth creamy medium seed size, 100 seed wt. 26 gm, MR to wilt	20-22	117	JG 130 x BG 8416	M.P.	<i>Kabuli</i> Normal sown
132.	RVKG 151	2019	Sehore	Smooth creamy extra-large seed size 100 seed wt. 54.3 g, medium tall and spreading plant type	20-21	113	Dollar x Kripa	M.P.	<i>Kabuli</i> Normal sown
133.	Pant Gram 6	2020	Pantnagar	Tall and semi erect plant type, seed are medium size with 18.1 g/100 seed Tolerance to wilt and BGM	21.67	145	PG 035 x HC 1	Uttarakhand	Rainfed/ Irrigated
134.	IPC 2004-98	2020	IIPR, Kanpur	Medium tall, semi erect growth habit green foliage, large and attractive seed shape and colour, 100 seed wt. 25.8 g	14.29	141	Phule G5 x DCP 92-1	U.P.	Normal sown
135.	IPC 2005-62	2020	IIPR, Kanpur	Medium and semi-erect growth habit, green foliage small seed with yellow cotyledons and resistance to wilt, 100 seed wt. 15.2g	10.18	118	DCP 92-3 x T 39-1	U.P.	Late sown, high seed protein content (25.5%)
136.	Sabour Chana 1 (BRC-1)	2020	Sabour	Bold seeded, high yielded in normal sown under irrigated condition, 100 seed wt. 24-26 g, MR to wilt and DRR	22-24	130-135	(PG 5 X H 82-2) X (PG 5 X GNG 469)	Bihar	Normal sown
137.	Him. Palam chana 1 (DKG 986)	2020	Dhaura Kuan	Early and cold tolerance 100 seed wt. 12.6 g, medium height, Resistance to AB and BGM	17.72	141-160	ICCV 88506X ICCV 90201	Himanchal Pradesh	Cold tolerance and drought

138.	IPC 2004-01	2021	ICAR-IIPR Kanpur	Medium tall and semi-erect growth habit, medium seed size(20.2 gm /100seed) with light brownish seed and moderately resistant to wilt	13.96	139	{9 RSG533 x BG391) x (ICCC42 xICC106)}	U.P.	Irrigated condition
139.	RKG 13-515	2021	Kota	Semi spreading growth habit, pink flower, medium brown seed colour, 100 seed weight: 22.49g, mod. resistant to wilt	24.55	104-115	GNG 469 X IPC 2729	Rajasthan	Irrigated condition
140.	RKKG 13-271	2021	Kota	Medium stature, white flower, cream coloured seed, 100 seed weight: 31.2 g Moderately resistant to wilt	24.70	110	ICC14194 x BG2058	Rajasthan	Irrigated condition
141.	IPC 2011-112	2021	ICAR-IIPR Kanpur	Medium and semi erect growth habit, green foliage, large seeded(20-22 g / 100seed weight) with yellow cotyledons resistant to wilt.	12.96	137	IPC94-94 x IPC2002-120	U.P.	Timely sown condition
142.	Chhattisgarh Chana -2	2021	Raipur	Erect and medium plant, light anthocyanin pigment on stem, 100 seed weight: 23.5 gmmoderately resistant to fusarium wilt	18.73	97	PG92-97 x <i>C.raticulatu m</i>	Chhattisgarh	Rainfed and semi irrigated condition,
143.	Nandyal Gram 452	2021	Nandyal	Semi spreading plant type, medium height, 100 seed weight 24.0 g, mod. resistant to wilt.	25.00	90-105	ICCV37 x ICC12451	Andhra Pradesh	Rainfed condition
144.	RVKG- 121	2021	Sehore	Medium tall and semi spreading plants, smooth surface, creamy colour and owl's head shaped seeds, 100 seed weight 27.83 g, resistant to Fusarium wilt	18-20	99-123	Pusa 1088 x FG 711	Madhya Pradesh	Normal sown
145.	RVG 210	2021	Sehore	Green plant are pubescent with anthocyanin and white flower,round seed shape yellowish cream seed with smooth surface, 100seed wt. 26.7 g., resistant to wilt & tolerant to pod borer.	18.05	105-110	BG362 x JG16	Madhya Pradesh	Normal sown
146.	Pant Gram 7 (PG172)	2021	Pantnagar	Semi erect plant type, seeds are medium with 20.67g/100seed weight,tolerant to wilt and root rot.	16.53	145	IPC98-12 x ICC395468	Uttarakhand	Normal sown
147.	Pant Gram 8(PG 170)	2021	Pantnagar	Suitable for rainfed/irrigated conditions, It is tolerant to wilt100 seed weight: 20.45g	16.30	144 days	PG 037 x PG 97-10	Uttarakhand	Normal sown
148.	Pant Gram 9(PG 158)	2021	Pantnagar	Suitable for rainfed/irrigated conditions. It is tolerant to pod borer, 100 seed weight 22.41g,tolerant to wilt	17.26	142 days	ICCC 42 x ICC 1069	Uttarakhand	Normal sown
149.	IPC 2010-134 (Shiva)	2021	ICAR-IIPR	Suitable for Irrigated; Timely sown, 100 seed weight: 23g; moderately resistant against Fusarium wilt	17.06	124-138 days	GNG 469 x FG 711	Uttar Pradesh	Normal sown
150.	IPC2007-28 (Atal)	2021	ICAR-IIPR	Suitable for Irrigated; Timely sown, Resistant against Fusarium wilt.	16.83	112-138 days	DCP 92-3 x JG 16	Uttar Pradesh	Normal sown
151.	Sabour Chana 2	2021	Sabour	Suitable for Late sown condition, time of sowing. Average yield: 18-20 q/ha; maturity duration (120 - 125 days); 100 seed weight 14.5g.	18-20	120 - 125	IPC98-12 x ICCV96029	Bihar	Late sown
152.	GNG 2261(Keshav)	2021	Sriganganagar	Suitable for Late Sown Irrigated conditions. Yellowish brown seed colour; protein content: 21.09%; 100 seed weight: 15.0 g	20.72	128 days	GNG 1581 x Pusa 1103	Rajasthan	Late sown
153.	PBG 8 (GL 13042)	2021	Ludhiana	Suitable for Irrigated conditions, moderately resistant to Botrytis grey	21.00	154-160	(GPF 2 x <i>Cicer judaicum</i>	Punjab	Normal sown

				mould and Fusarium wilt diseases; 100 seed weight 16.5g			acc. 185) x GPF 2		
154.	Phule G 15109 (Vishwaraj)	2021	Rahuri	Suitable for rainfed condition; 100 seed weight: 22-23g; Protein content- 22.91	16.28	95-105	ICCV 93952 x IVVV 94954	Maharashtra	Rainfed

Address of Project Coordinator and Principal Investigators

Dr. G.P. Dixit
Project Coordinator
AICRP on Chickpea
Indian Institute of Pulses Research, Kanpur 208 024

Phone (O) : 0512 - 2580993
 EPABX : 0512 –2580994, 2580995 Ext. 6108
 M. : 09936149224
 Fax : 0512 – 2580992
 E mail : aicrciipr@yahoo.co.in

Principal Investigators

Discipline	Name & Address	Telephone & Fax No.
Crop Improvement	Dr. A.K. Srivastava Senior Scientist Chickpea Coordination Unit, ICAR-IIPR, Kanpur, Uttar Pradesh	Office 0512 - 2580993 EPABX: 0512-2580994-95 Ext. 6109 M: 08756995677 Email : bhu.avinash@gmail.com
Crop Production	Dr. Narendra Kumar Principal Scientist (Agronomy) ICAR-IIPR, Kanpur 208 024 Uttar Pradesh	Office: 0512 -2580994-95, Ext. 3008 Fax :0512 – 2580992 M: 9473929876 Email :nkumar.icar@gmail.com
Crop Protection	Dr. D.R. Saxena Head (Pl. Pathology) & I/c AICRP on Chickpea RAK College of Agriculture, RVSKVV, Sehore 466 001 (MP)	EPABX: 07562-227140 (O) Fax: 07562-227139 M: 09425079059 Email :saxenadr123@gmail.com
Entomology	Dr. Ravinder Singh Principal Entomologist (Pulses), PAU, Ludhiana 141 00	Office: 0161-2401960 Ext. 413 M: 09780029107 Email :ravindergurwara@pau.edu
Microbiology	Dr. (Mrs.) Poonam Sharma Principal Scientist (Microbiology), Pulses Section, Punjab Agricultural University, Ludhiana-141004 (Punjab)	Office: 0161-2401960 Fax: 0161-2400945 M:08146295100 Email :poonam1963in@yahoo.co.in
Front Line Demonstration & Breeder Seed Production	Dr. A.K. Srivastava Senior Scientist Chickpea Coordination Unit, ICAR-IIPR, Kanpur, Uttar Pradesh	Office 0512 - 2580993 EPABX: 0512-2580994-95 Ext. 6109 M: 08756995677 Email : bhu.avinash@gmail.com