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# PULSE INDIA

AN INDIA PULSES AND GRAINS ASSOCIATION PUBLICATION

- **Pulses for Health**
- **Khariff Pulses Crop Outlook 2020**
- **Pusa Chickpea 20211**
- **Kabuli Chickpeas Power Packed Pulses**



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# Chairman Message



Dear Members,

The global Covid-19 pandemic is a definitive factor this year, and the pulses and grains sector is no exception. While it has thrown up a myriad of challenges, it has opened doors to a lot of opportunities as well.

At IPGA, we are glad to have made gold of the opportunity to connect with thousands of global stakeholders through the various webinars under the IPGA Knowledge Series in which, every month, we discuss major trends and pressing issues in the pulses sector. It has been an honour to invite and host distinguished experts and sector stalwarts, both national and international, in the webinars, and their incisive and exclusive insights have been valuable takeaways for our audience. Needless to say, the response has been tremendous and is growing, and we are heartened to continue harnessing technology to deepen the engagement.

That brings me to the annual highlight of IPGA. In February 2021, we will be celebrating the 5th World Pulses Day, hence in the same month, we will be convening IPGA's 'National Pulses Seminar'. The two-day seminar will be held virtually, and will cover multiple aspects of the pulses sector, including nutrition, policy reforms, technology, research, production, and weather expectations. All domestic and global trade stakeholders can attend the seminar free of cost. I take this opportunity to extend to you a warm invitation on the behalf of IPGA and look forward to seeing you at the seminar.

Offline, we have been conscious of the on-ground impacts of the pandemic and consequent lockdowns. Accordingly, IPGA decided to support governmental relief measures for migrant workers and daily wage earners by distributing 10,000+ ration bags to the affected groups in and around Mumbai and Kolkata. While IPGA has contributed around INR 91 lakhs to this cause, we are very proud and grateful to mention that more than 40 of our distinguished members have contributed by collectively adopting and supporting 6000 families.

Throughout the pandemic and the ensuing lockdowns, agriculture has been one of the few unhalted sectors, recording a steady growth. Monsoon rains this year have been in the range of sufficient to excessive, and while certain crops have suffered from damage across many states such as Maharashtra, Madhya Pradesh, Gujarat and Karnataka, other crops have shown a good harvest. Especially, rabi harvests in early 2021 seem to be promising. The government has shown considerable flexibility in opening up the markets to imports; the season of festivities commencing October onwards is usually expected to shoot up demand for pulses and the imports are instrumental in keeping prices in check.

Globally, the rising trend of vegetarianism has given a boost to pulses and grains sector. Experts from North America and Australia have confirmed rising trends in pulses production, and growing farmer resilience to fall in prices in their region.

Overall, the changing dynamics post Covid-19 i.e. the 'new normal', impact of weather, and growing demand for vegetarian protein signal interesting times ahead. Through our efforts such as the IPGA Knowledge Series and the upcoming National Pulses Seminar, IPGA looks forward to keeping you abreast of these exciting developments. Stay tuned.

ZAVERCHAND (JITU) BHEDA

CHAIRMAN

India Pulses and Grains Association



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## Contents

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- 1 Chairman Message
- 4 Pulses for Health by Sheela Krishnaswamy
- 7 Pulses And Covid-19 By Zeal Doshi & Sheryl Salis
- 15 Khariff Pulses Crop Outlook 2020 by Nirav Desai
- 22 Pusa Chickpea 20211 by Chellapilla Bharadwaj & Rajeev K Varshney
- 25 Mung Beans 2020 Outlook by Anish Goyal
- 27 Kabuli Chickpeas Power Packed Pulses by Harsha Rai
- 30 Indian Pulses Production Renewing Focus on Challenges by Dr. Hanish Kumar Sinha
- 34 Recipes
- 38 Pulses Import Statistics Research 2019-2020 by Nikita Chury
- 40 First Advance Estimates of Production of Foodgrains for 2020-21

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# Pulses for Health

**Sheela Krishnaswamy**  
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**We all have known for a long time that the key to good health is eating right, among other things. A well-rounded meal plan should have a variety of foods from all food groups like cereals, pulses, vegetables, fruits, nuts, seeds, dairy, etc.**

Pulses and dals have been around in India for as long as we, and many previous generations, can remember. Pulses have been an integral part of Indian diets for centuries and we continue to depend upon pulses to make our meals more wholesome. The year 2016 being declared as the International Year of Pulses by the United Nations gave a boost to pulses, globally.

The infographic below (courtesy pulses.org) beautifully traces the history of pulses over many centuries.

Some of the commonly used pulses and dals in India are channa, rajma, moong, tur, urad, masoor, soybean, horse gram, etc. Vegetarians and vegans depend on pulses to a great extent, for their protein requirement. Either in the whole form or split into dals, pulses are an everyday ingredient in gravies, dal makhni, dal fry, sambar, rasam, khichdi, idli, dosa, cheela, seasonings, accompaniments and much more. Besan (channa dal flour or gram flour in common parlance) is most often used to make sweet dishes like burfi, laddu, mysore pak and halwa, and in savouries like mixture, sev, dhokla, bhujia, bajji, bonda, chakli, and many others. Interestingly, besan has also been used as an exfoliating agent on the face, and as a cleanser for the body in place of soap. In other cuisines, pulses find a place in soups, salads, casseroles, burritos, falafel, hummus, and so on.

Nutrition-wise, pulses provide protein, fibre (soluble and insoluble), complex carbohydrates, some amount of vitamins and minerals like iron,

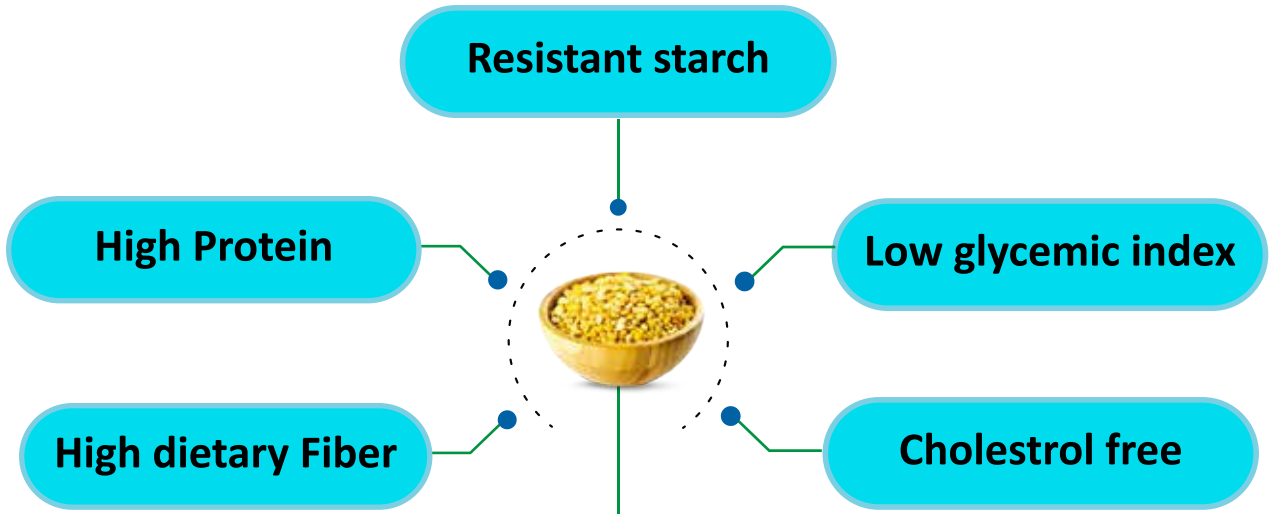
zinc, folate, magnesium, etc. Although pulses are high in protein content, they need to be combined with cereals in order to obtain the benefit of all the essential amino acids. Idli, dosa, pongal, khichdi, roti-dal are some examples of cereal-pulse combination. Pulses and dals have very little fat unless they are deep fried or included in oily gravies. Raw pulses can be stored for many weeks without losing their nutritional value. Pulses are also rich in bioactive constituents like polyphenols, phytosterols, resistant starch, oligosaccharides and dietary fibre that are beneficial for managing and preventing many diseases.

Soybean has a higher quality and quantity of protein when compared to other pulses. Isoflavones present in soybean have been extensively studied in women for menopausal health benefits.

A study done in Ethiopia to assess the impact of pulse-nutrition education on improving mothers' knowledge, attitude, practices towards pulses as well as its effect on children's diet diversity and nutritional status, concluded that the education improved the mothers' knowledge, attitude and practices regarding pulse consumption and also led to improved nutritional status of the children due to dietary diversity (Teshome et al, 2020).

The high fibre content and low glycemic index of pulses help to improve blood glucose and insulin levels. The iron content in pulses can be made bio-available by combining them with foods rich in vitamin C. Since they are gluten-free, pulses and dals can be given to all gluten-intolerant persons. Pulses are a great substitute for meat because they are cholesterol-free and contain almost no saturated fat. Soaking and rinsing the pulses before cooking helps to reduce their flatulence effect.

Sprouting is another great way to consume pulses. This process increases the vitamin content and enhances the digestibility of pulses. Saponins, which are naturally present in pulses, may have cholesterol lowering effects and may also inhibit tumour growth. Sprouting helps to retain the



# Building Protein Rich Nations

ETG is the largest processor of pulses in India and globally. ETG delivers everyday nutrition with its range of protein rich pulses. Our farm to fork connect enables us to ensure mass availability of our products and achieve pan-India reach. With ETG Pulse protein guarantee, we are committed to making every meal nutritious, thereby fulfilling the goal of making nations protein rich.

Range of Pulses and Besan



**We procure locally grown crops, contributing to the betterment of farmers.**

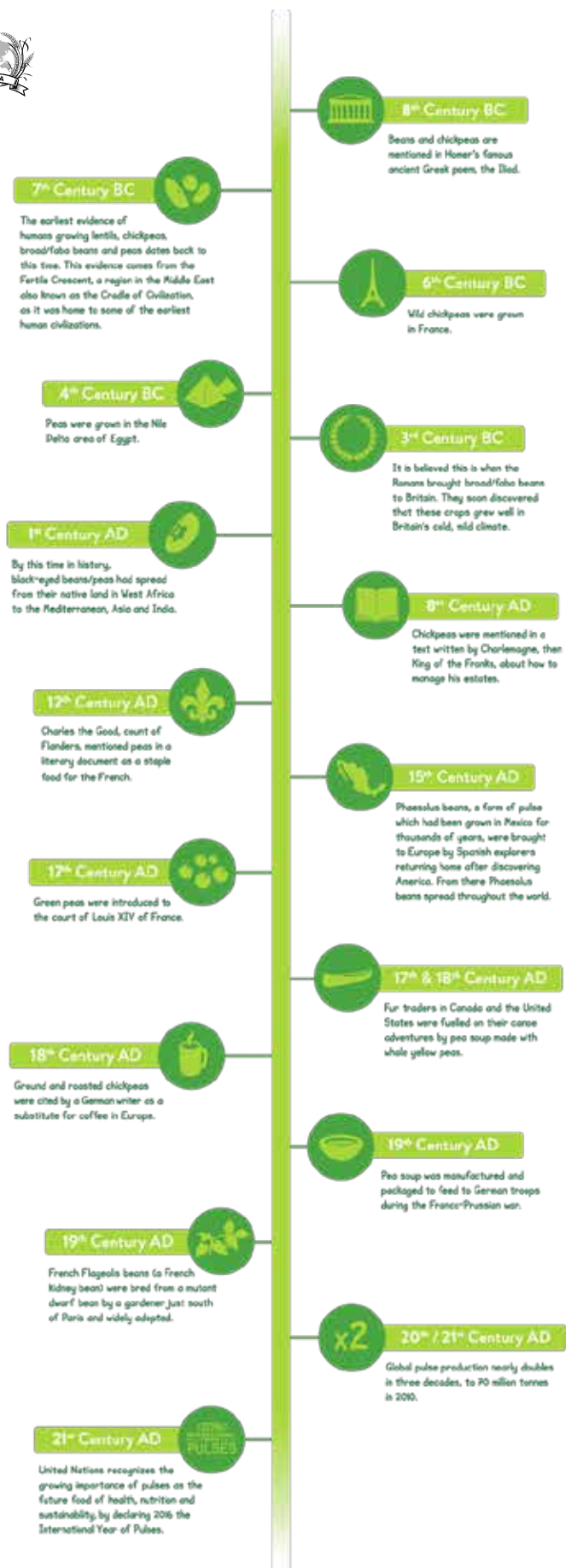


saponins in pulses which would otherwise be diminished during cooking. The phytochemicals present in pulses are believed to be beneficial too. A randomized controlled trial done by Kazemi et al and published in *Nutrients* 2018, found that a pulse-based diet may be more effective than the Therapeutic Lifestyle Changes (TLC) diet in improving cardio-metabolic disease risk factors in women with PCOS.

Although pulses play an important role in building health, they are consumed in lesser quantities than required. The recommended intake of pulses per day is anything between 60 to 120 g per adult per day (depending upon the activity and gender of the individual). This quantity can be distributed over 2 to 3 meals in the day. An article published by a group of scientists from different countries in *Nutrition Reviews* (Marinangeli et al, 2017), says that 100 g of pulses provides a number of nutrients that qualify for nutrient content claims under regional regulatory frameworks.

While the current pandemic is leading to lost jobs, reduced food and increased malnutrition on the one hand, it is also making us sit up and take notice of what we really need to eat in order to build and maintain health. Including pulses in the daily diet is a healthy way to meet dietary recommendations. So, start this habit today!

[www.youtube.com/c/SheelaKrishnaswamy-NutritionNectar60](http://www.youtube.com/c/SheelaKrishnaswamy-NutritionNectar60)  
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# Pulses And Covid-19

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Pulses or Legumes are plants belonging to the family Leguminosae also called as Fabaceae that produce seeds within a pod. Leguminosae is a large family with more than 18,000 species of climbers, herbs, shrubs and trees of which only a limited number is used as human food.

The Food and Agriculture Organization of the United Nations (FAO) defines pulses as dry-harvested leguminous crops, which include several varieties of beans, peas, lentils, and chickpeas. Pulses do not include legumes with high levels of fat/oil or moisture at the time of harvest, such as soybeans and peanuts, or fresh beans and peas. Simply put, all pulses are legumes, but not all legumes are pulses. According to the FAO, pulses represent an important component of healthy diets.

The Food and Agriculture Organisation of the United Nations recognises 11 primary leguminous classes which are dry beans, dry broad beans, dry peas, chickpeas, dry cow peas, pigeon peas, lentils, Bambara beans, vetches, lupins, minor pulses.

Pulses are believed to be one of the first crops cultivated by mankind and have been a staple food for many cultures all over the world. It's an inexpensive meat alternative and are considered the second most important food source after cereals. It has also been ascribed economical, cultural, physiological and medicinal roles owing to their possession of beneficial bioactive compounds. Pulses play an important role in many diets all over the world and are especially important in developing

countries in Africa, Latin America and Asia. In India pulses contribute as the most common source of non-cereal protein. Since most of the Indian population is vegetarian, pulse consumption is higher than that of any other protein source. The mainly grown pulses in India include mungbean (green gram), chickpea (Bengal gram), urd bean (black gram), lentil (masur), pigeon pea (arhar), cowpea, horse gram and peas.

## Coronavirus (COVID 19)

Coronaviruses are positive-sense RNA viruses having an extensive and promiscuous wide range of natural hosts and affect multiple systems. Coronaviruses can cause clinical diseases in humans that may extend from the common cold to more severe respiratory diseases like Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). More recently, the WHO had announced COVID-19 an official name for this disease. Due to the severity of this outbreak and the potential of spreading on an international scale, the WHO declared a "global health emergency" on January 31st, 2020 and subsequently on March 11th, 2020, a pandemic situation.

Coronavirus infection in humans is commonly associated with mild to severe respiratory disease that are characterized by high fever, cough associated with difficulty in breathing / Shortness of breath, chest pain/ pressure, tiredness, severe inflammation, nasal congestion, aches and pain, headache, etc.

Older people and those with underlying medical conditions like high blood pressure, heart and lung problems, diabetes, cancer and other health conditions are at higher risk of developing serious illness.



## Nutritional Profile of Pulses:

### Macronutrients:

#### Carbohydrates:

Pulses consist of 55-65% of complex, energy giving carbohydrates. It has leguminous starch which is digested slower than starch from cereals and tubers in the body. It's also a valuable source of dietary fiber (5-37%), containing significant amounts of both soluble and insoluble dietary fibre. The monomers in pulse dietary fiber include glucose, galactose, fucose, arabinose, rhamnose, xylose and mannose. It also contain significant amounts of resistant starch and oligosaccharides mainly raffinose.

#### Protein:

They are an excellent source of good quality protein. It consists of 20 to 45% protein that is generally rich in the essential amino acid like lysine. Peas and beans are on the lower side of the range with 17–20% proteins while lupins and soybeans are on the higher end of the range with 38-45% protein. Legumes have higher protein content than most plant foods with about twice the protein content of cereals. Leguminous proteins, except soy protein are low in essential sulphur containing amino acids (SCAA) like methionine, cysteine and tryptophan and are therefore considered to be an incomplete source of protein. In order to improve the protein quality pulses and cereals are eaten in combination as cereals are high in SCAA and low in lysine.

#### Fat:

They do not have cholesterol and are generally low in fat. It provides  $\pm 5\%$  energy from fat while peanuts ( $\pm 45\%$ ), chickpeas ( $\pm 15\%$ ) and soybeans ( $\pm 47\%$ ) being an exception. The fat in legumes constitutes of significant amount of mono and polyunsaturated fatty acids (PUFA) and virtually no saturated fatty acids. The highest amount of PUFA (71.1%) and monounsaturated fatty acids (34%) are reported in kidney beans and chickpeas, respectively. The PUFAs present in pulses include both the essential omega-6 linoleic acid ( $\omega 6$ ) and omega-3 alpha-linolenic acid ( $\omega 3$ ). These PUFAs are essential for human health as the human body cannot synthesise them and therefore they must be included in the diet.

### Micronutrients:

Pulses are good source of B-group vitamins such as folate, thiamine and riboflavin but are poor source

of vitamin C and fat soluble vitamin. Kidney beans is considered to have higher amount of thiamine and riboflavin than other pulses. They are also rich in essential minerals like zinc, iron, calcium, selenium, phosphorus, copper, potassium, magnesium and chromium. Due to its low sodium content, it is desirable considering the recent trends encouraging sodium reduction.

### Bioactive compounds and non-nutrients in pulses:

Pulses contain bio-active compounds such as phytochemicals and anti-oxidants which include isoflavones, lignans, protease inhibitors, trypsin and chymotrypsin inhibitors, saponins, alkaloids, phytoestrogens and phytates. They are also called anti-nutrients. Most of them are non-toxic; they generate adverse physiological effects and interfere with protein and certain mineral digestion. Soaking helps reduce antinutritional factors like phytates, tannins and enzyme inhibitors thus increasing absorption value of nutrients from these foods. Most of these anti-nutrients are heat labile and since pulses are consumed after cooking, they do not pose a health hazard. Therefore it is advisable to soak and cook pulses to increase the nutrient availability from them and meet the protein and mineral requirements.

Saponins and glycosides are another group of bioactive compounds found in pulses such as lentils, chickpeas, soybean and peas. These compounds have been reported to possess hypocholesterolemic and anticarcinogenic activity.

Other important bioactive compounds found in pulses include polyphenols and their derivatives such as flavanols, flavan-3-ols, anthocyanins/anthocyanidins, condensed tannins/proanthocyanidins and tocopherols. Pulses with coloured seed coats such as Bambara groundnut, black bean, red kidney bean and black gram, have long been associated with antioxidant and anticarcinogenic activity.

### Serving Size of Pulses:

In India, the Dietary Guidelines for Indians—A Manual (2020) specifies 30g of uncooked pulses as a serving and suggests that 30 g and 60 g of whole uncooked pulses be consumed daily by non-vegetarians and vegetarians, respectively



CHA No. 11/1875

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## Health Benefits of Pulses:

### Nutritional composition of various pulses per 100 g

Food	Moisture (g)	Protein (g)	Ash (g)
Bengal gram, dal (Cicer arietinum)	9.18±0.58	21.55±1.45	2.10±0.10
Bengal gram, whole (Cicer arietinum)	8.56±0.37	18.77±0.42	2.78±0.13
Black gram, dal (Phaseolus mungo)	9.16±0.35	23.06±0.59	3.17±0.02
Black gram, whole (Phaseolus mungo)	8.70±0.33	21.97±0.63	3.35±0.03
Cowpea, brown (Vigna catjang)	9.42±0.39	20.36±0.59	2.90±0.11
Cowpea, white (Vigna catjang)	9.32	21.25	2.83
Field bean, black (Phaseolus vulgaris)	9.57	19.93	2.73
Field bean, brown (Phaseolus vulgaris)	8.74	19.90	2.74
Field bean, white (Phaseolus vulgaris)	8.61±0.36	19.84±1.04	3.09±0.15
Green gram, dal (Phaseolus aureus)	9.77±0.67	23.88±0.61	3.04±0.03
Green gram, whole (Phaseolus aureus)	9.95±0.42	22.53±0.43	3.22±0.04
Horse gram, whole (Dolichus biflorus)	9.28±0.57	21.73±0.29	3.24±0.11
Lentil dal (Lens culinaris)	9.71±0.48	24.35±1.10	2.23±0.13
Lentil whole, brown (Lens culinaris)	9.20±0.77	22.49±0.58	2.39±0.35
Lentil whole, yellowish (Lens culinaris)	9.75	22.87	2.20
Moth bean (Vigna aconitifolia)	8.14±0.49	19.75±0.38	3.14±0.18
Peas, dry (Pisum sativum)	9.33±0.61	20.43±0.79	2.41±0.09
Rajmah, black (Phaseolus vulgaris)	8.69	19.01	3.35
Rajmah, brown (Phaseolus vulgaris)	9.68±0.79	19.50±0.84	3.36±0.19
Rajmah, red (Phaseolus vulgaris)	9.87±0.30	19.91±1.44	3.28±0.21
Red gram, dal (Cajanus cajan)	9.20±0.61	21.70±0.50	3.26±0.03
Red gram, whole (Cajanus cajan)	9.30±0.45	20.47±0.72	3.53±0.03
Ricebean (Vigna umbellata )	11.12	19.97	3.54
Soya bean, brown (Glycine max)	5.51±0.13	35.58±0.66	4.74±0.31
Soya bean, white (Glycine max)	5.47	37.80	4.52

Note : Data derived from Indian Food Composition Table (IFCT),  
National Institute of Nutrition, 2017.



Total fat (g)	Dietary fibre (g)			CHO (g)	Energy (g)
	Total	Insoluble	Soluble		
5.31±0.06	15.15±0.17	12.67±0.22	2.48±0.15	46.72±1.29	1377±10
5.11±0.11	25.22±0.39	22.70±0.60	2.52±0.87	39.56±0.16	1201±9
1.69±0.12	11.93±0.26	7.58±0.13	4.35±0.15	51.00±0.80	1356±9
1.58±0.06	20.41±0.06	15.47±0.05	4.94±0.07	43.99±0.76	1219±5
1.15±0.06	11.54±0.13	8.75±0.09	2.80±0.05	54.62±0.49	1340±7
1.14	11.70	8.91	2.79	53.77	1340
0.92	23.40	17.99	5.41	43.46	1155
0.98	22.40	17.32	5.08	45.24	1184
0.94±0.02	22.99±0.83	17.45±2.27	5.54±2.28	44.53±1.42	1173±24
1.35±0.20	9.37±0.38	7.75±0.39	1.62±0.19	52.59±0.45	1363±10
1.14±0.17	17.04±0.38	14.59±0.42	2.44±0.15	46.13±0.64	1229±10
0.62±0.04	7.88±0.02	6.22±0.03	1.66±0.03	57.24±0.50	1379±9
0.75±0.04	10.43±0.39	8.60±0.42	1.83±0.23	52.53±1.05	1349±11
0.64±0.02	16.82±1.30	14.16±1.33	2.66±0.42	48.47±1.12	1251±23
0.61	16.66	14.15	2.51	47.91	1246
1.76±0.09	15.12±0.49	14.50±0.44	0.62±0.10	52.09±0.96	1291±16
1.89±0.08	17.01±0.63	14.55±0.73	2.47±0.17	48.93±0.45	1269±13
1.62	17.74	15.16	2.58	49.59	1247
1.68±0.07	16.95±0.27	14.33±0.19	2.62±0.16	48.83±0.59	1245±12
1.77±0.04	16.57±0.63	13.86±0.43	2.70±0.20	48.61±0.65	1252±14
1.56±0.03	9.06±0.30	6.67±0.23	2.39±0.15	55.23±0.83	1384±10
1.38±0.08	22.84±0.43	19.69±0.30	3.15±0.34	42.48±0.77	1146±10
0.74	13.37	10.04	3.33	51.26	1265
19.82±0.26	21.55±0.66	16.56±0.30	5.00±0.52	12.79±0.97	1596±11
19.42	22.63	17.04	5.59	10.16	1579



## Respiratory Quotient:

Respiratory quotient, also known as the respiratory ratio (RQ), is defined as the volume of carbon dioxide released over the volume of oxygen absorbed during respiration. It indicates the fuel mixture being metabolized in the body. The RQ for carbohydrate is 1 because the number of carbon dioxide molecules produced is equal to the number of oxygen molecules consumed.

RQ volume of CO<sub>2</sub> expired/volume of O<sub>2</sub> consumed (VO<sub>2</sub> /VCO<sub>2</sub>)

RQ values:

1 = carbohydrate

0.85 = mixed diet

0.82 = protein

0.7 = fat

## Respiratory Quotient and COVID 19

In conditions like COVID 19 there is inflammation in the lung which causes chronic obstruction of airflow. Chronic inflammation of the bronchioles along with mucus production causes them to become deformed and narrow, limiting the airflow as a person exhales. Since the patient is not able to fully exhale, carbon dioxide remains in the alveoli due to loss of elasticity of the sac. The patients suffer from shortness of breath, cough and complicated pneumonia.

In studies it has shown that carbohydrate rich food increases production of CO<sub>2</sub>, leading to an increase in respiratory rate. Meals with moderate protein and fat decreases the production of CO<sub>2</sub>, leading to reduce alveolar ventilation and minor improvement in respiration as RQ of protein and fat is 0.85 and 0.7 respectively.

## Benefits of Pulse intake in COVID 19

- Its high protein and low carbohydrate content make as ideal food for patients with COVID 19 as it helps to manage RQ.
- With a low glycaemic index, low fat and high fibre content, pulses are suitable for people with

diabetes. Pulses increase satiety and help to stabilize blood glucose and insulin levels by reducing spikes after eating and improving insulin resistance as uncontrolled diabetes is one of underlying medical conditions for developing COVID-19

- Pulses may reduce the risks of coronary heart disease. They are high in dietary fibre, which is helps in reducing LDL cholesterol, a recognized risk factor in coronary heart disease.
- Pulses' high iron content makes them a potent food for improving haemoglobin levels especially when combined with food containing vitamin C to improve iron absorption.
- The protein quality of vegetarian diets and plant-based diets is significantly improved when pulses are eaten together with cereals.
- Pulses are rich in bioactive compounds such as phytochemicals and antioxidants boosting the body's immune system to fight infections.
- Its high protein content helps in building muscle, manage weight especially when there is catabolism due to fever and inflammation in the body.

## Ways of incorporating pulse in the diet:

- In the form of sambhar, rasam with idli, dosa or dal, ussal, amti with rice and chapati
- Dal chilla/pancakes/ dosa- Besan chilla, Moong dal chilla with mint and coriander chutney
- Sprout salad-Ragma salad, Chickpea salad, Moong (Green gram dal) salad with buttermilk
- Sprouts with paratha, chapatti
- Dal Paratha
- Sattu (roasted chickpea flour)
- Lentil soup
- Missal
- Dal Dhokli
- Khandvi, Dal Dhokla, Handvo. Dal wada, Dal tikkis

## Conclusion:

Pulses are an inexpensive, sustainable source of protein, unsaturated fat, dietary fibre, complex carbohydrate, micronutrients, and important bioactive phytochemicals. This composition of



**Pradeep Jindal,**  
Managing Director



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pulses makes it an ideal food to consume during the pandemic period to boost immunity, fight infections and protect oneself from COVID-19. In order to harness the nutritional benefits of pulses, it should be incorporated into the regular diet from children to adults.

## REFERENCES

- Cakir, Ozgur & Uçarlı, Cüneyt & Tarhan, Cagatay & Pekmez, Murat & Turgut-Kara, Neslihan. (2018). Nutritional and health benefits of legumes and their distinctive genomic properties. *Food Science and Technology*. 39. 10.1590/fst.42117.
- Polak, Rani & Phillips, Edward & Campbell, Amy. (2015). Legumes: Health Benefits and Culinary Approaches to Increase Intake. *Clinical diabetes : a publication of the American Diabetes Association*. 33. 198-205. 10.2337/diaclin.33.4.198.
- Singh, B., Singh, J. P., Shevkani, K., Singh, N., & Kaur, A. (2017). Bioactive constituents in pulses and their health benefits. *Journal of food science and technology*, 54(4), 858–870. <https://doi.org/10.1007/s13197-016-2391-9>
- Maphosa, Yvonne & Jideani, Victoria. (2017). The Role of Legumes in Human Nutrition. 10.5772/intechopen.69127.
- <https://euagenda.eu/upload/publications/untitled-62351-ea.pdf>
- Wu, Guoyao. (2016). Dietary protein intake and human health. *Food Funct.*. 7. 10.1039/C5FO01530H.
- Dietary Guidelines for NIN, ICMR 2020
- Scoditti, E., Massaro, M., Garbarino, S., & Toraldo, D. M. (2019). Role of Diet in Chronic Obstructive Pulmonary Disease Prevention and Treatment. *Nutrients*, 11(6), 1357. <https://doi.org/10.3390/nu11061357>
- Margier, M., Georgé, S., Hafnaoui, N., Remond, D., Nowicki, M., Du Chaffaut, L., Amiot, M. J., & Reboul, E. (2018). Nutritional Composition and Bioactive Content of Legumes: Characterization of Pulses Frequently Consumed in France and Effect of the Cooking Method. *Nutrients*, 10(11), 1668. <https://doi.org/10.3390/nu10111668>
- Havemeier, Stefanie & Erickson, Jennifer & Slavin, Joanne. (2017). Dietary guidance for pulses: The challenge and opportunity to be part of both the vegetable and protein food groups. *Annals of the New York Academy of Sciences*. 1392. 10.1111/nyas.13308.
- Goris, Annelies & Westerterp, Klaas. (2000). Postabsorptive respiratory quotient and food quotient - An analysis in lean and obese men and women. *European journal of clinical nutrition*. 54. 546-50. 10.1038/sj.ejcn.1601052.
- KL, Mahan & Escott-Stump, Sylvia & JL, Raymond. (2012). *Krause's Food & the Nutrition Care Process*.
- Marinangeli, Christopher & Curran, Julianne & Barr, Susan & Slavin, Joanne & Puri, Seema & Swaminathan, Sumathi & Tapsell, Linda & Patterson, Carol Ann. (2017). Enhancing nutrition with pulses: Defining a recommended serving size for adults. *Nutrition Reviews*. 75. 990-1006. 10.1093/nutrit/nux058.
- Kussmann, Martin. (2010). Nutrition and immunity. *RSC Food Analysis Monographs*. 268-309.
- Dhama, Kuldeep & Khan, Sharun & Tiwari, Ruchi & Sircar, Shubhankar & Bhat, Sudipta & Malik, Yashpal & Singh, Karam & Chaicumpa, Wanpen & Bonilla-Aldana, D. & Rodriguez-Morales, Alfonso. (2020). Coronavirus Disease 2019 – COVID-19. 10.20944/preprints202003.0001.v2.
- Indian Food Composition Table ,National Institute of Nutrition, 2017
- <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses>

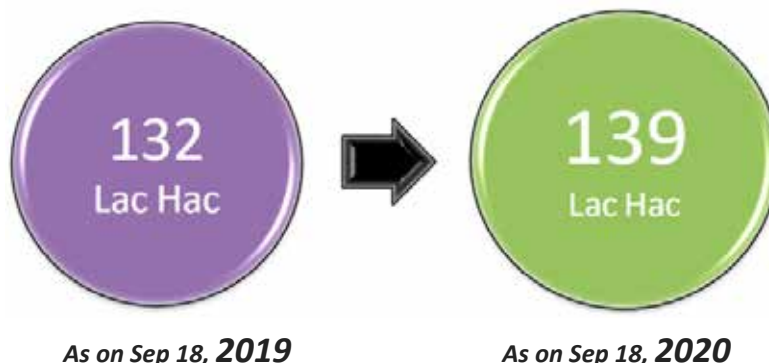




# Khariff Pulses Crop Outlook 2020

Nirav Desai  
Managing Partner,  
GGN Research Co.

## Higher Sown area under Khariff Pulses Crops



(Sown area is 5.3% higher in 2020 compared to 2019)

## Normal Rainfall

Normal rainfall of the period  
(June 1 – Sept 30)

**880 mm**



Actual rainfall this year  
(June 1 – Sept 30)

**958 mm**

(8.8% higher than normal rainfall this year)

*This year agriculture operations across the country is progressed smoothly with kharif pulses crops recording 5.3% higher sown area as on 18<sup>th</sup> Sep compared to the corresponding period last year.*

*Acreage of all major kharif pulses crops such as Arhar, Urad, Mungbean has crossed last year's corresponding figures despite lockdown-linked disruptions during the initial week.*

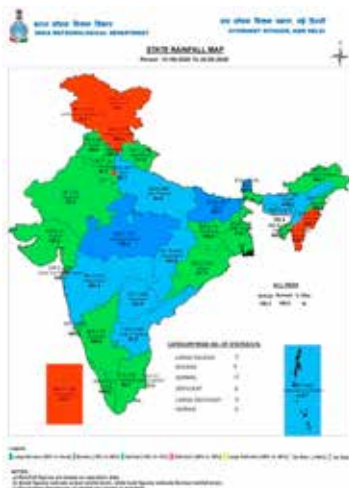
*There is no impact of Covid-19 on progress of area coverage under Khariff crops.*



## Weather

Riding on favorable start of monsoon season Kharif crops sowing start healthy in India

### June-2020 (18% Surplus)



In the first month of SW Monsoon 2020, the overall rainfall at all India level in June 2020 was 196.2 mm, 18% above normal rainfall in the month at 166.9 mm. It was 33% deficit last year. This is India's wettest June in last 12 years. All four IMD regions (North west, Central, South, East

& NE) have recorded surplus rainfall, the surplus is the highest in Central (30.5% surplus) and E-NE (15.7%) regions. North West India had the lowest surplus at 3.5%. Whole of India was covered by monsoon on June 26, 12 days ahead of the normal date of July 8.

Monsoonal rainfall got off to an exceptionally good start this year and Khariff Crops were planted faster than usual. The early start to the monsoon season gave farmers a great jump on planting and fieldwork is far more advanced than usual.

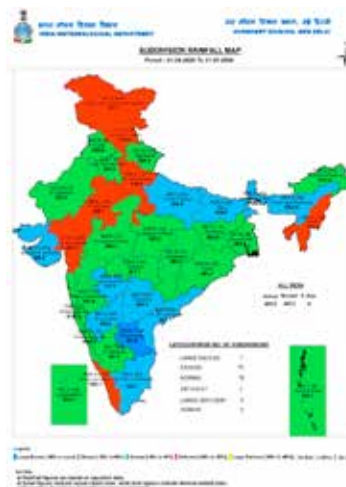
Rainfall in India during the month of June was abundant and sufficient enough to support aggressive early season farming activity.

Overall, much of central through eastern India and in a few interior southern locations reported rainfall well above normal. Even with the above normal rainfall for the country as a whole this year, many areas in northern India have reported lighter than usual rainfall in June 2020.

Rajasthan, northern fringes of Madhya Pradesh and northern Uttar Pradesh into Punjab, Haryana, and Himachal Pradesh have reported below average rainfall in June 2020. Soil moisture is generally adequate to excessive for the remaining production areas in India.

Planting has advanced swiftly in much of the country and progress is well ahead of last year's pace due to poor early season rainfall in 2019.

### July -2020 (9.9% Deficient)



The second month of SW Monsoon 2020, overall rainfall at all India level in July 2020 was 257.1 mm, 9.9% below normal rainfall in the month at 285.3 mm. The Surplus of 18% rainfall that India received in June 2020 has been wiped out by the 9.9% deficit in July rainfall. By the end of July 2020 India

received 453.3 mm rainfall, just 1.1 mm above the normal rainfall of 452.2 mm during the period.

Precipitation has been variable in India for July 2020 month.

Northwestern, central and eastern Rajasthan is one of the larger areas of lighter than usual rainfall.

Many other areas in northern, central and eastern India reported near normal precipitation.

In few areas of Rajasthan have short to critically short moisture due to the lack of monsoonal rain this season. Western Gujarat and portions of southern Tamil Nadu have short to very short topsoil moisture as well.

The problem started here as the crop witness moisture stress.

Crop development has advanced unevenly or poorly in much of Northwestern India this season.

### August-2020 (26.6% Surplus)

Rains begins to improve from early August and evolve on a near daily basis from Gujarat, southern and eastern Rajasthan, and northern Maharashtra into central, northern, and eastern India.

India received 44 year old high surplus rainfall of



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## Pulses

327 mm in just concluded Aug 2020, 26.6% above normal rainfall of 258.2 mm. This helped the total June-Aug 2020 rainfall to achieve 10% surplus, with actual rainfall 780.3 mm, 69.9 mm higher than normal rainfall of 710.4 mm.

Many crop areas are benefited with most of the driest regions of western and northern Rajasthan and some of the far northernmost crop areas in the nation that have been reporting good rains.



But continuous and excessive rains caused local flooding in lot of areas.

Non-Stop rains started damaging the pulses crop in second half of August.

### September - 2020 (8.75% Surplus)

India received total June to Sept 2020 rainfall to achieve 8.75% surplus, with actual rainfall 958 mm, 78 mm higher than normal rainfall of 880 mm.

Rains continued damaging crop in M.P, MH & Karnataka. However, monsoon has started to withdraw from Northwest India and most of the rains have shifted towards eastern and Central India.



Monsoonal disturbance continue to produce late season rains which have interrupted harvesting and deteriorated quality. Rajasthan till now has not been much affected but if rains continuous losses can be seen there also.

As of 18 Sep'20 areas covered under Khariff Pulses crop is higher by 6.28 lac Hac over last year to 138.87 Lac Hac.

	2020	2019	Change	% Change
Arhar	48.24	45.46	2.78	6%
Urad	38.63	38.03	0.59	1%
Moong	35.79	30.75	5.04	16%
Others	15.95	18.10	-2.15	-12%
<b>Total</b>	<b>137.87</b>	<b>131.76</b>	<b>6.28</b>	<b>5%</b>

(Source: GOI)

With the early start of monsoon this year sowing of Kharif Pulses progressed rapidly.

Maharashtra, Madhya Pradesh, Rajasthan, Uttar Pradesh & Karnataka are the main khariff pulses growing states.

Government has hiked the MSP of pulses which has improved farmers planting intention.

All the key states are showing an increment in acreage except Rajasthan as significance of rains was poor and lack of soil moisture did not support pulses cultivation.

### Arhar

Arhar (Tur) is one of the main Kharif pulses crop mainly cultivated in Maharashtra, Madhya Pradesh, Karnataka and Uttar Pradesh states.

All the main growing states are showing a marginal increment in acreage except Madhya Pradesh where farmers have preferred soybean over Arhar crop.

As of 18 Sep'20 area covered under Arhar crop is higher by 2.78 lac Hac over last year to 48.24 Lac Hac.



	2020	2019	Change	% Change
Karnataka	12.80	11.71	1.07	9%
Maharashtra	12.47	12.06	0.41	3%
Madhya Pradesh	4.12	5.06	-0.94	-19%
Uttar Pradesh	3.53	3.51	0.01	0%
Others	15.24	12.89	2.35	18%
<b>Total</b>	<b>48.24</b>	<b>45.46</b>	<b>2.78</b>	<b>6%</b>

(Source: GOI)

Rainfall continues to occur routinely in main Tur growing southern states and Maharashtra supporting a good outlook for 2020.

The erratic rains did not affect the Tur crop as it was not in its important Pod filling stage.

As of now, Tur crop prospects seems to be good, but in next 2-3 months crops will go through important yield determining phases like flowering, Pod filling and Maturing .

### Moongbean

Rajasthan, Maharashtra and Karnataka are the major Moong producing states.

Rajasthan is the main Moong growing state which contributes for around 60% of nation's crop.

Moong Crop is cultivated at different part of year but it is mainly a Khariff season crop. The Khariff Moong is sown during 15 June to 15 July and harvested from 15 Sept to 15 Oct.

Due to late arrivals of monsoonal rains in Rajasthan planting is slightly delayed. While other states planting started timely.

Govt has hiked MSP for 2020 of Moong to Rs 7196 per Qtl from Rs 7050 per Qtl. It's a highest MSP amongst any other pulses, this encourage farmers to plant more Moongbean.

As of 18 Sep'20 areas covered under Moong crop is higher by 4.96 lac Hac over last year to 35.66 Lac Hac.

	2020	2019	Change	Expected Yield	Production Prospects
Rajasthan	20.89	18.26	2.63	Better/Same as LY	Better than LY
Karnataka	4.40	2.68	1.72	Poor than LY	Same as LY
Maharashtra	3.94	3.24	0.70	Poor than LY	Poor than LY
Others	6.34	6.52	-0.17	Poor than LY	Poor than LY
<b>Total</b>	<b>35.79</b>	<b>30.75</b>	<b>5.04</b>	<b>Same to Poor</b>	<b>Same as LY</b>

(Source: GGN)

Northern India and Rajasthan received less than usual rainfall. However, none of the drier bias areas were in a dire situation as it is lower irrigated crop, the time to time significance of light rains had supported the crop.

Despite of the moisture deficits in Rajasthan Moong crops are rated quite favorably because of the timeliness of what rain has occurred.

The rains have increased in Moong growing areas of Rajasthan which has uplifted the crop prospects and crop is expected to show some good recovery in production potentials.

This year Moong crop has developed in average conditions and crop prospects seems to be slightly better than last year.

### Urad

Madhya Pradesh, Uttar Pradesh, Maharashtra and Rajasthan are the major Urad producing states.

Madhya Pradesh is the largest Urad growing state accounts for around 44% of nations crop, second largest state is Uttar Pradesh which accounts for around 18% of nation's crop.

The early start to the monsoon season had facilitated Urad planting.

Government hiked the MSP to Rs 5515 per Qtl from Rs 5255 per Qtl, but farmers were not satisfied with the MSP purchase, so were not keen in Urad planting.

Planting area has increased only due to early arrivals of monsoonal rains which have supported sowing.

As of 18 Sep'20 area covered under Urad crop is higher by 0.39 lac Hac over last year to 38.27 Lac Hac.



	2020	2019	Change	Expected Yield	Production Prospects
Madhya Pradesh	16.01	16.5	-0.49	Poor than LY	Poor than LY
Maharashtra	3.88	2.87	1.015	Poor than LY	Same as LY
Rajasthan	3.76	4.56	-0.8	Better than LY	Same as LY
Uttar Pradesh	6.92	7.01	-0.14	Better than LY	Same as LY
Others	9.442	10.26	-0.818	Same as LY	Poor than LY
<b>Total</b>	<b>38.62</b>	<b>38.03</b>	<b>0.59</b>	<b>Poor than LY</b>	<b>Poor than LY</b>

(Source: GGN)

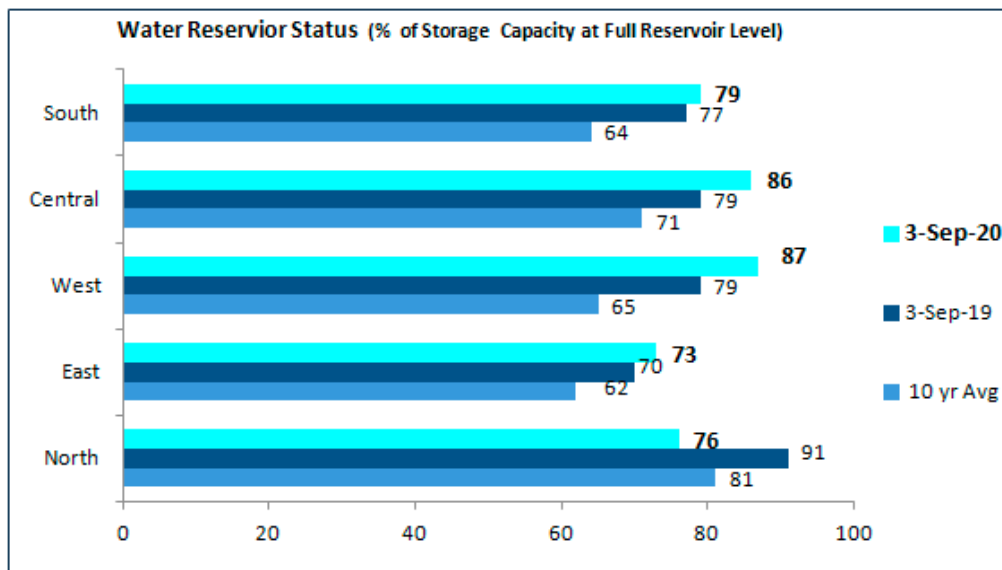
The favorable start to the rainy season could not perpetuate through July in Madhya Pradesh and northwestern Rajasthan due to which top soil moisture dried up.

M.P. contributes for 42% of India's crop. excessive rains, Water logging and Yellow Mosaic disease has caused severe crop losses. North M.P. has poor yields where as Neemuch belt is not so bad.

Maharashtra yields are below last year due to excess rains.

Overall, all India Urad crop prospects have deteriorated over last year.

## Water Reservoir Status of India 2020



(Source: GOI)

As we can see water reservoir for irrigation in South, Central, Western and Eastern India is better than previous year and also above 10 years average. Only problem persists with Northern India where reservoir is lower than previous year and 10 year average.

This Rabi season 2020-21 due to favorable irrigation conditions area under cultivation will be higher like last year. So we do not expect any big change in acreage.

DISCLAIMER: this report is prepared by GG Patel & Nikhil Research Company (GGN). The information and opinions Contained in the document have been compiled from sources believed to be reliable. GGN does not warrant its accuracy, Completeness and correctness. Use of data and information contained in this report is at your own risk. This document is not, And should not be construed as, an offer to sell or solicitation to buy any commodities. GGN and its affiliates and/or their Officers, directors and employees may have positions in any commodities mentioned in this document (or in any related investment) and may from time to time add to or dispose of any such commodities (or investment).



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# Pusa Chickpea 20211 (Pusa Chickpea Manav)

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## High-yielding Fusarium wilt resistant chickpea variety developed through genomics-assisted breeding for commercial cultivation in central zone of India

### Introduction

Chickpea (*Cicer arietinum* L.) is one of the most important food legume crops for the resource poor farmers in the South Asia, Indian sub-continent and Sub-Saharan Africa. The major chickpea growing countries include India (67.4%), Australia (6.21%), Pakistan (5.73%), Turkey (3.86%), Myanmar (3.74%) and Iran (2.25%).

In India, the chickpea area declined from 4.7 to 0.7 m ha in northern India from 1965 to 2010 and increased from 2.1 to 6.1 m ha in central and southern India between 1967-2012. Although the recent years have witnessed growth in area and production in chickpea, the crop productivity is still around one ton per ha mainly due to adverse effects of biotic and abiotic stresses. For instance, Fusarium wilt (FW) is a devastating root disease of chickpea in central and southern India that can lead up to 100% yield losses under favourable conditions. *Fusarium oxysporum* f.sp. *ciceris* is a soil borne pathogenic fungus, that causes FW, differs in pathogenic variability. Based on variation in virulence among isolates of *foc* races, eight distinct physiological races were reported namely races 0, 1A, 1B/C, 2, 3, 4, 5 and 6 (Jendoubi et al. 2017). The genes/QTLs for resistance to six races (0, 1A, 2, 3, 4 and 5) of FW pathogen have been mapped on to the chickpea genetic map. Therefore it is imperative to develop resistant varieties for FW specially for central zone which is the largest chickpea growing region in India.

## Advances in genomics-assisted breeding

Recent advances in genomics research has facilitated deployment of genomics tools for improving the elite varieties through genomics-assisted breeding (GAB). By following GAB approach, Ethiopia released a drought tolerant variety, called “Geletu” in 2019 (<https://www.cgiar.org/news-events/news/first-ever-high-yielding-chickpea-variety-developed-using-marker-assisted-backcrossing-mabc-released-in-ethiopia/>). The variety delivered the highest grain yield of 3822 kg/ha at Arsi Robe, Ethiopia, which translates into an yield advantage of 15% over the check variety ‘Teketay’ and 78% more than the local check. Similarly, India released drought tolerant Pusa Chickpea 10216 and FW resistant Super Annigeri 1 varieties in 2019 (<https://icar.org.in/content/development-two-superior-chickpea-varieties-genomics-assisted-breeding>). “Pusa Chickpea - 10216” has an average grain yield of 1,447 kg/ha with over 11% yield superiority over the recurrent check variety Pusa - 372 under the moisture stress condition of the Central Zone of India. Similarly, Super Annigeri-1 variety has an average grain yield of 1,898 kg/ha and has recorded about 7% increase in yield over Annigeri-1 and is highly resistant to *Fusarium* wilt disease, an important yield reducing factor in South India.

## Development of Pusa Chickpea 20211 (Pusa Chickpea Manav) variety

Pusa Chickpea 20211 is a GAB product developed through introgression of “QTL region” for wilt resistance on chickpea linkage group (chromosome) 2 having QTLs for resistance to races 1,3,4 &5 from WR 315 line. This variety was developed by ICAR-Indian Agricultural Research Institute (ICAR-IARI) in strong collaboration with ICRISAT. While the breeding work, back crossing and evaluation of the segregating lines was taken up by ICAR-IARI, the



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molecular mapping and GAB work with genomics tools such as molecular markers was undertaken at the Centre of Excellence in Genomics & Systems Biology (cegsb.icrisat.org) at ICRISAT. The Central Varietal Release Committee of Ministry of Agriculture and Farmers Welfare, Government of India has released this variety for commercial cultivation in central zone comprising Madhya Pradesh, Gujarat and Maharashtra.

### Features of Pusa Chickpea 20211 (Pusa Chickpea Manav) variety

Newly developed Pusa Chickpea 20211 variety recorded an overall weighted mean yield advantage of 28 % over recurrent parent Pusa 391 across all the centers tested in National Wilt Resistance Introgression Line (WRIL) Trials under ICAR- All India Coordinated Research Project (AICRIP)-Chickpea over two consecutive years across central zone of testing namely, *Rabi* 2018-19 (25 % over Pusa 391 over six locations) and *Rabi* 2019-20 (30 % over Pusa 391 over five locations). This variety gave an overall weighted mean yield of 2392 kg/ha and has an yield potential of 3915 kg/ha under wilt stress conditions over the recurrent parent Pusa 391 which yielded 1877 kg/ha. Pusa Chickpea 20211 gave an average yield of 2533 kg/ha in its final year of testing which surpasses even the commercial check means of final year of testing which included JAKI 9218 (1865 kg/ha), JG 16 (1878 kg/ha), and Indira chana-1 (1526 kg/ha) giving 35.8%, 34.9% and 66 % respectively.

Pusa Chickpea 20211 is an early flowering and early maturing variety. It flowers in about 56 days and its duration is about 108 days. It is therefore an ideal variety for the sustainability of rice-based fallow cropping systems. Due to its short duration it also fits in Central and South Zones. It has an excellent grain color, size and shape. Its average 100-seed weight is 19.5 g. Its grain protein content is 18.92

per cent. It is highly resistant to *Fusarium* wilt and is moderately resistant to dry root rot, collar rot and stunt. It is moderately resistant to pod borer. It is a profusely branching variety with more number of pods per unit area.

### Conclusion

Development and release of the Pusa Chickpea 20211 variety along with two earlier GAB products (Geletu and Super Annigeri -1) has put chickpea in the elite crop group where GAB has come of the age.

“Pusa Chickpea 20211 a high-yielding disease resistant variety is a testament of successful application of genomics for crop improvement and the fruitful partnership with ICRISAT”, said Dr Trilochan Mohapatra, Secretary (DARE) and Director General, ICAR on the release of the variety.

Dr Jacqueline Hughes, Director General, ICRISAT, congratulating all scientists for developing this variety, said, “ICRISAT is very pleased with this development and committed to such innovations in crop improvement programmes that support the farmers in India and elsewhere.”

Dr Chellapilla Bharadwaj the Principal Breeder of this variety from ICAR-IARI shared his excitement by saying, “This improved chickpea variety will be boon to farmers in Central India where crop productivity is challenged by *Fusarium* wilt disease.”

Dr Rajeev K Varshney, Research Programme Director, ICRISAT, who contributed genomics research and support for the development of this variety, added, “It is the need of the hour to include such translational genomics trait deployment to deliver better varieties to farmers”. We are very much hopeful to see development and release of many GAB varieties in chickpea in near future that will help enhancing crop productivity and income generation to small holder farmers.



Seed features of Pusa Chickpea 20211 variety



A close up of Pusa Chickpea 20211 variety with pods



A field view of Pusa Chickpea 20211 variety



# Mung Beans 2020 Outlook

Anish Goyal

Director,

GPA CAPITAL FOODS PVT. LTD.

Green gram also known as moong is one of the main pulse crop of India. It is a rich source of Protein along with fibre and iron. It can be cultivated as Kharif as well as summer crop.

India being the major producer of green gram in the world and grown in almost all the States. It is grown in about 36 lakh hectares with the total production of about 17 lakh tonnes of grain with a productivity of about 500 kg/ha. The important green gram growing States in the country are Orissa, Maharashtra, Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan and Bihar. This year Kharif crop as a whole has seen significant increase of 32.33% in the land area from 6.2 to 8.2 Million HA. Specifically about green mung beans they have also seen a significant increase in land area of 30.31% from 1.6 to 2.1 Million HA. There could be numerous reasons for the same but some of major reasons that encouraged farmers to grow more are good monsoon rains, increase in MSP to 7196 and good prevailing market prices throughout the year. Considering India as a whole the area sown has increased from 3.02 to 3.49 million HA. Now for us its easy to say that there will be a bumper crop this season but due to continues rain in Maharashtra, Karnataka and some other states there are greater chances of some part of crop being damaged.

The major states where area sown of green mung has increased are Karnataka, Maharashtra, Gujrat and Rajasthan. In Karnataka area sown has increased by 50% from 256 to 385 thousand HA. In Maharashtra area sown has increased by 20% from 322 to 384 thousand HA. Rajasthan has seen a major increase in land area despite of already being the biggest producer, area sown has increased from 1820 to 2035 thousand HA. This year crop from MP, Maharashtra and Karnataka has seen quite a lot of rain because of which 60-70% of the crop is damaged. Also there is a huge price gap between good quality mung beans and the degraded ones. The price variation of the same is between rupees 30 to 60 per kg. As stated above, the major chunk of Mung beans lies in Rajasthan which is harvested a bit later than all the other mung bean producing states. Rains were there during the initial weeks of harvesting due to which the initial crop harvested might be a bit damaged. Looking at the current scenario, the overall supply of Rajasthan is good but the size of damaged crop has increased in size than what I expected. Therefore, I can say that the rains this season has made a major impact on the overall supply of mung beans, despite of the increase in area sown there is shortage of good quality mung beans.

Talking about the milling sector, the production has slowed down due to degraded raw material. Millers are not able to get optimized numbers of finished products. Also, the quantity of rejections that we get from the raw material has increased and on the other hand quantity of finished product is decreasing.

Talking about the moong stock with the government, earlier they were selling 2018 stock and 2019 stock of 145 hundred thousand lakh mt they started selling last week. I expect this year Kharif production will increase by 17-18% from 1.79 to 2.15 Million MT.

The demand for this year is much better than that of last year this is mainly because of the increase in price of Moth beans. Moreover, covid also plays a major role in increasing mung beans demand, as

STATE-WISE MOONG SOWING (In thousand HA)		
STATE	2020-21	2019-20
Karnataka	385	256
Maharashtra	384	322
Madhra Pradesh	157	177
Rajasthan	2035	1820
Gujrat	88	62
Telengana	60	61
Others	291	281

(Source: India Agristat)



they have the highest protein content in the pulse family. And people have shifted to greener source of protein, hence this complimented the mung beans demand. Talking about the demand across India, a lot of foreign companies all over the world approached Indian processors for procurement, this is sign that mung beans demand has increased not only in India but all over the world.

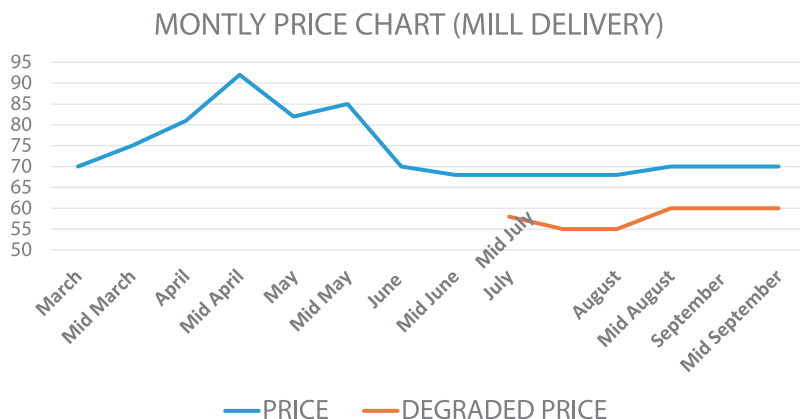
Now this bring me to my next point that is covid-19 and how it affected the millers. Yes, pulses being under the essential commodity but still during initial days of lockdown we faced a lot of problem in every aspect of business you can imagine of. Firstly, the manpower got reduced which affected our production significantly. Secondly, transportation was a major issue both at the time of procurement as well as sale. There were delays during delivery and procurement of goods. As this was a new situation for everyone, even the government realized the importance of pulse millers. They were very supportive in every aspect and in fact encouraged millers to continue their operations. Moreover, the government officials made sure that we have enough labor required to continue our operations. Due to increasing number of cases, fear in people, labor shortage milling supply decreased and on the other hand the demand kept on increasing as people were panic buying pulses. On the top of it, quite a few millers closed their doors due to fear of Covid, this was like icing on the cake and made the demand supply parity even verse. Sudden spike of prices, problem in the supply chain and panic stocking baffled everyone in the industry and was very problematic. Eventually everything fell into place and started normal flow of business.

Talking about the imports, government have asked the people to apply for quota but haven't released

yet. A bit of import has happened only from Mozambique against MOU between both the government.

Now in front of you all, there is a price chart of mung beans starting from the month of March. During March the prices were at their normal level at which they usually are, but starting from the month of April prices started increasing during the initial weeks but still the market was bullish because people were panic buying And in the same month they even touched the highest mark. Towards the end of April, market turned its position to bearish firstly because people had already stocked a lot and secondly, the lockdown rules were getting stricter, that affected the sales. For the month of may the dip continued. Till June the prices reached from where they started. This was because MP, Karnataka and Maharashtra started catering the country. And as the crop was damaged you can see the price gap between the damaged and the good quality moong starting from the month of July. There was at least 10-rupee gap on an average during their entire supply. Now talking about Mung bean prices in the near future, looking at the current scenario there are two qualities of crop available in the market. So the traders and government can only buy the good quality crop as they have selling constraints and millers having wider variety of options available, they can buy both the qualities and due to this what I think the availability will be sufficient throughout the year. Therefore because of the above reasons I expected that the prices won't increase and will remain constant in the near future. But now looking at the current scenario mung beans prices are more than what I expected this is because Rajasthan's crop is also damaged and as it's the major producer of the crop. Hence

there is shortage for good quality of mung beans, because of this reason supply of good quality of crop is less. Looking from the perspective of millers, yes they have the option of buying degraded quality of the crop but for them conversion cost from raw to finished has increased. Therefore, the price of finished product has increased and now I expect they will remain constant until government starts selling there stock.





# Kabuli Chickpeas Power Packed Pulses

**Harsha Rai**

MAYUR GLOBAL CORPORATION

Global Sales Head

Chickpeas (Scientific name: *Cicer arietinum* L.) are a pulse crop that belongs to leguminosae family. The most common varieties are the desi and Kabuli chick peas. These two types have different production requirements, markets and end uses. Kabuli Chick peas are also called as garbanzo beans or Chana or Egyptian peas. Kabuli chickpeas are known for their large size; beige- coloured throughout skin and smooth coat or can say with a thin skin.



In India, normally the official crop production number include both desi chickpeas and Kabuli chickpeas production data , as such no separate official number available for

Kabuli chickpeas but as per trade resources and other mandi data available, Kabuli Chickpeas accounts for 10-15% of the total Chickpeas production of country.

## Types of Kabuli Chickpeas

In India two types of Kabuli chickpeas are grown, one is primarily known as dollar Chana which is like the Mexican variety Blanca Sinaloa type. Dollar Chana is bigger in calibre say 9mm to 12mm. The other one is spaniola type which is known as Cok-2

Chana in India. This is smaller in size ranging from 5mm to 8mm.

## Growing areas



Kabuli Chickpeas is mainly grown in three states in India, Madhya Pradesh, Maharashtra, and Andhra Pradesh. Interestingly, central part of India that is Madhya Pradesh is the main growing area for Kabuli chickpeas and out

of total crop close to 50-60% of the crop gives a larger calibre Kabuli chickpea that is 9mm to 12 mm. Other states like Maharashtra and Andhra Pradesh mainly grows the smaller calibre chickpeas, includes 5mm to 8mm and some tonnage for 9mm Kabuli chickpeas. Main exports happen from the central part of India which is mainly for larger calibre chickpeas ranging from 9mm to 12mm size.

## Climate

Chickpeas are mostly sown as a rain fed crop. Being a winter season legumes it requires fairly cold and dry climate but severe cold and frost are injurious to it. Also excessive rains soon after spring or at flowering and fruiting or hailstorm at ripening causes heavy loss.

## Production in India

Year	Production (MT)	Exports (MT)	Seed & Domestic use (MT)	Carry over (MT)	Ending stock (MT)
2017	255,000	90,000	165,000	5,000	5,000
2018	620,000	200,000	325,000	5,000	100,000
2019	440,000	130,000	325,000	100,000	85,000
2020	325,000	100,000	205,000	85,000	105,000

(Source: GOI)



## **Pandemic and demand scenario in India**

This year seeding was less as compared to last year and hence we expected lower production as well. Initially it was clear in February that domestic annual demand and exports will help market stocks to finish and carryover for this year would be very low going forward. But India went into lockdown in March third week and by that time only 50-60% of crop was harvested and remaining still was still in the field. Though government did allow growers to continue harvest and thus harvest was complete by mid-April. Lockdown did bring the immediate demand in local market but also the exports slowed due to restrictions and logistics constraints.

Kabuli chickpeas are considered as a premium product in the Indian pulse industry. It is consumed in so many different ways in Indian local markets. The Kabuli Chickpea is used predominantly for human consumption in India. Kabuli chickpea is mostly consumed as whole seed. It is either consumed separately or combined with other dishes.

Mostly consumed in restaurants, hotel industry, street food in north part of India, various social gathering and mainly a festive and wedding season commodity. With lockdown in place all this demand disappeared and the local consumption went down and now left behind is more than initially expected carryover. Also importing countries covered their immediate demand from other origins and hence logistics constraints didn't gave Indian exporters much room for exports during lockdown. Ultimately exports from India were less than expected at the start of crop year. Though we still have more than two months until we get our new crop but with the increasing Covid cases, we have again seen restrictions in terms of social gatherings, wedding etc and hence less demand for Kabuli chickpeas at this time of year as compared to normal year.

### **MSP for Rabi crops for marketing season 2021-22.**

The Cabinet Committee on Economic Affairs (CCEA) chaired by the Prime Minister Shri Narendra Modi has approved the increase in the Minimum Support Prices (MSPs) for all mandated Rabi crops for marketing season 2021-22. The highest increase in MSP has been announced for lentil (Rs. 300 per quintal) followed by gram and rapeseed & mustard (Rs. 225 per quintal each) and safflower (Rs. 112 per quintal). For barley and wheat, an increase of Rs. 75 per quintal and Rs 50 per quintal respectively

has been announced.

### **Expected Seeding**

This year Kabuli chickpeas acreage will face tough competition from several other Rabi crop commodities. For instance Mustard seeds would attract higher sowing this year due to record high prices also there higher MSP of Mustard. Govt is aiming for record high 7.5 mln ha mustard sowing in 2020-21. Mustard accounts for over 80% of total rabi oilseed output in the country.

Another one is lentils, again higher MSP and Government is stressing on higher seeding this year. Total area is on the pace to advance from 1.067 to 1.8 million hectares.

Desi Chana acreage is expected grow as govt plans to provide subsidized seeds to the growers plus higher price this year will attract more acreage. Govt buys Chana at msp from growers which give them a definite buyer for their produce.

Seeding for Kabuli chickpeas has started, actual seeding numbers will be available after mid-December. So far weather is ideal for seeding in all main growing areas. In Nimad(Madhya Pradesh) region seeding is higher from last year so far which has to some extent taken cotton crop acreage. In Malwa region also seeding is as per last year's pace. Next 20days are more important to watch in terms of how seeding takes its speed and acreage.

### **Market outlook**

However, the market for chickpeas is volatile. Many producers saw an opportunity in the global demand for chickpeas which resulted in higher production volumes in recent years. Meanwhile, the production in India, world's largest chickpea producer, has been fluctuating as well, causing prices to go up in 2017 and crash down again in 2018 due to overproduction. Due to this, world stocks were more than the actual demand and hence it took a bit longer for those stocks to finish and hence continued pressure on prices all over the place. This has now resulted in lower seeding acreage again in many origins in 2020 which might help in balancing the world stocks for Kabuli chickpeas. Very important role is played by weather every year, the India Meteorological department (IMD) predicted last month that winter this year will likely be colder due to la Nina conditions. So it's very important to watch weather in November-January 2021 period.



## Future trend

The growth of modern chickpeas consumption in addition to the traditional demand will drive the growth of the global chickpeas market in future.

- 1. Snack Food Industry/ Convenient Food:** - Chickpeas is increasingly being accepted as an easy to make and healthy snack. Chickpeas are a rich source of fibre, folate, protein, and zinc. Chickpea snacks are easy to prepare at home by adding spices and are easily available in the market as ready-to-eat (RTE) products.
- 2. Canned or dried, Kabuli Chickpeas** have their position in every kitchen now. Chickpeas can be used to add to salads, soups, stews, chilies, casseroles, greens, or as an addition to grain dishes.
- 3. Healthy Food / Bread:** - Demand for nutritious food, as well as ingredients that are vegan and free from allergens such as gluten. A naturally gluten free chickpeas flat bread popularity and global acceptance can be seen. Chickpeas have all the characteristics of an ideal nutritious health food, which is providing to be a great advantage for its consumption growth globally.
- 4. Deserts:** - its ice cream with fibre and high protein or it is the perfect summer ice cream cake that's secretly healthy; chickpeas are making their way in desert market globally.
- 5. Plant-based:** - The demand for plant protein is high and expected to continue to grow. Plant based is becoming the part of mainstream lifestyle. Increased number of vegans has resulted in great demand for plant based products and definitely chickpeas have made its place due to high nutritional value. Globally people are eating less meat and more plant protein products.  
Demand for new plant based protein products has led to many new products development. It's time to venture beyond the hummus bowl. Kabuli Chickpeas is a great source of protein and fibre, and hence Kabuli chickpeas flour is now broadly used in pasta and rice making, Chickpeas cookie dough, chickpeas protein bars and many more.
- 6. As a new protein source,** companies have developed chickpea protein concentrate. Also plant protein isolate from chickpeas to use as an alternative for dairy in few parts of world.
- 7. Pet food market:** - Chickpeas made their way in pet food market. High protein content made

them suitable for pet food industry. More research work going on for same.



## Health Benefits of Kabuli chickpeas

Kabuli Chickpeas have nutritional value and that the reason nutritionist all over the world is promoting same. Few of them are listed below:-

- 1. Prevents Spikes in Blood Sugar Levels :-** According to a recent study, it took only one week of garbanzo bean consumption to improve blood sugar and insulin secretion, which suggests that chickpeas can help prevent and even reverse type II diabetes.
- 2. Good Heart health and Digestion:** - Like most legumes, chickpeas have been praised for their fibre content, which promote regularity for a healthful digestive tract. Significant amount of fibre helps lower the total amount of cholesterol levels in blood, thereby decreasing the risk of heart disease.
- 3. Bone health:** - Calcium, Zinc, vitamin K in chickpeas etc. all contributes to building and maintaining bone structure and strength. It is rich in Folate, Vitamin B9, and Magnesium etc.
- 4. Protein Rich:** - One cup of chickpeas yields nearly 1/3 of the recommended daily protein intake of an adult.
- 5. Inflammation:** - The choline in chickpeas help with sleep, muscle movement, learning and memory.
- 6. Aids Weight Management:** - Rich in fibres, chickpeas can help you feel full longer when you are trying to lose weight.



# Indian Pulses Production Renewing Focus on Challenges

Dr. Hanish Kumar Sinha  
Agri Business Consultant

Indian pulses industry has been consistently grappled with the challenge of acute supply, growing demand and lack of focus from the government entities. Pulses complement the cereals in both production and consumption, in production they require relatively lesser water, increase soil fertility, keeps pests in control when in rotation with other cereals. But, Pulses have been given a step treatment since the late 1960's i.e. the advent of green revolution which saw multiple increases in the production of several crops with pulses production growing the least. It has also been observed that a higher support price for pulses in relation to other crops has had minimal reaction from the farmer community leading to negligible increase in the production. Ever since the pulses were being pushed to marginal and rain fed lands, the phenomena of yield gap started creeping in the pulses production. The difference between the Indian and the world pulses yield is quite significant, but even when it is compared with Indian Research stations and actual farming situation, there is a significant gap. The maximum yield gap is being reported in case of Pigeon Pea (49.68 per cent) followed by Green Gram (45.09 per cent), Lentil (38.30 per cent), Black Gram (33.81 per cent) and Chick Pea (31.23 per cent). As per and estimate, If one could manage to bridge Yield Gap (in line with Front Line Technology Demonstrations), our pulses scenario would have been quite different and we would have easily attained self-sufficiency in pulses by producing over 32 million MT in the year 2020 – which certainly seems to be distant dream in reality.

Price fluctuation is also high in case of pulses, leading to higher risks, turning farmers away from production of pulses. The cure may be in the form of non-price factors such as better variety of seeds, Infrastructure. The situation showed improvement in the period after 2014-15 where increased attention as once again targeted to this sector. Owing to increased focus the production of pulses for the first time crossed 20 million MT mark in 2016-17 and is continuing above that mark ever since.

The challenge for the Indian pulses farmers is that pulses do not form a part of the Government's Public Distribution System and Buffer Stock Schemes. These are schemes in which Government procures the crops at support prices in peak seasons to release at subsidized rates in times of shortage. This helps in maintaining price stability. This way both consumers and producers are shielded from the fluctuation of prices. Adding to the challenge is the modification in the Essential Commodities Act, which at one point of time allowed the government of India to control the price of essential commodities, and also decide to increase or decrease the supply of the product in the market. It also gives the government to regulate through licenses, permits or otherwise the storage, transport, distribution, disposal, acquisition, use or consumption of any essential commodity. But now with the change in the new order the stocking limits in most of the commodities have been removed. Stock limits will be imposed only under exceptional circumstances like national calamities, famine with a surge in prices. No such stock limit shall apply to processors or value chain participants, or any exporter subject to export demand. The entry of the private players in the commodity procurement and stocking is going to change the market dynamics – making it more competitive and transparent ensuring better realization for the farmers.

There are other deep rooted challenges in the pulses sector which have to be mulled to arrive at a

Pulses Production in India (Million MT)						
Pulses/Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21*
Tur	2.56	4.87	4.29	3.32	3.83	4.04
Gram	7.06	9.38	11.38	9.98	11.35	10.68
Moong	1.59	2.17	2.02	2.46	2.46	2.61
Urad	1.95	2.83	3.49	3.06	2.04	2.90
Lentil	0.98	1.22	1.68	1.23	1.18	1.14
Other Pulses	2.18	2.66	2.56	2.03	2.29	2.07
<b>Total Pulses</b>	<b>16.32</b>	<b>23.13</b>	<b>25.42</b>	<b>22.08</b>	<b>23.15</b>	<b>23.44</b>

Source: Ministry of Agriculture and Farmers Welfare & Authors Estimate\*



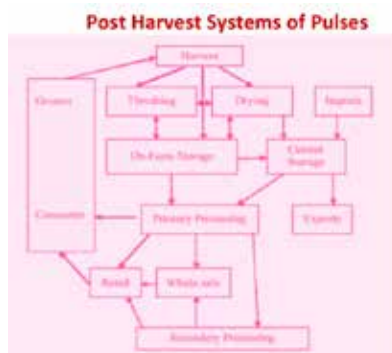
final cure of this crisis. On the production side, there is poor infrastructure, pest infestations; lack of market information amongst the farmers and antiquated production techniques which are being used on rain fed marginal farms. In the marketing side, the supply of pulses suffers from a long supply chain further distorting the farm price and retail prices. Imported pulses prices suffer at the hands of the domestic agencies that are poor in the judgment of how much to import and at what price to sell. Moreover, to maintain a price stability in the domestic market the Exports have been banned but this is also controversial since India in the last decade has become a major player in the market of processed pulses; thus the banning of exports has been a double edged sword; one it has led to the losses and near closures of mills in the country and exploitation by countries such as Myanmar have increased owing to India's absence from the scenario. There have been several instances where a large demand from India wrecks the International Prices Shooting. The final brunt is borne by the consumer so much such that if there is bad weather in Myanmar (large exporter of pulses to India) the Prices skyrockets in India. Such is menace of a high dependence on Imports. Further adding to the woes is too much Intermediation and profit margins involved before the Government agencies procure these pulses. As a result they end up paying a far higher price in the International market leading to overall losses. The domestic and International tendering and bidding process creates a monopolistic market environment leading to rise of prices. Keeping the above factors in consideration, in order to support the pulses farmers and move towards the doubling of the farmer's income certain stringent measures are required as:

- Pulses which are known to be highly price sensitive should be allowed to trade on commodity exchanges with close supervision as they are very speculative in nature.
- The working of the agencies at the state level has so far been neglected. Policy actions need to be implemented in the same.
- Public distribution System at subsidized Prices for pulses should be started.
- Selective credit Control measures need to be taken in case of pulses.
- Banning of exports is not a solution considering that exports are roughly 1% of the total supply.
- The market of Processed pulses in which India

has been able to create a niche for itself should not be banned from being exported.

The current chain of handling the pulses is the traditional function which is highly inefficient, fragmented and not systematic comprising of farmers, traders, middleman, agents and the millers who are the influential supply chain players or elements. The major points of concern are lack of connectivity from villages to markets, lack the knowledge about the process of Sorting and Grading, multiplicity of stakeholders working in isolation, absence of process of demand estimation forcing the farmers to pour in as much of the produce they cultivate and the presence of large number of unorganized retailers who are linked with farmers through wholesalers or commission agents.

For the improvement of the entire system and making the pulses growers the real beneficiaries, a well devised supply chain management



system need to be planned which could cater to the needs of the entire participating stakeholder and deliver the final product to the consumer in an effective and economic manner. For the improvement of the system one has to ensure the vertical coordination of farmers through cooperatives, contract farming and retail chains that would facilitate better delivery of output, reduce market risks, provide better infrastructure, attract more public interest, acquire better extension services and create awareness regarding the prevailing and new technologies. Customized logistics is another important immediate requirement to make logistic effective. This reduces the cost, facilitates the maintenance of quality of the produce and fulfills the requirements of targeted customers. Information system for better coordination among different stakeholders from farmers to consumers is the need of the hour. The internet and mobile communication can also be used to enable information and financial transfer between the stakeholders in the pulses supply chain. The Public Private Partnership (PPP Model) is



another strategic solution which could enhance the different functions in the pulses supply chain like washing, waxing, grading, sorting, packing, pre-cooling, handling facilities, insurance, finance, transport and processing facilities would add value to supply chain functioning. The last step which could help the overall improvement is the establishment of Mega Food Parks which would provide the required infrastructural and common facilities essential for marketing of the several Value Added Products which could be presented to the retail consumers in a big way.

Value Addition in Pulses is an area to be explored commercially for enhancing the income of the primary producers and providing varied products to the end users. Since the time of Purans and Mahabharata pulses have been an integral part of Indian Diet as dal - chawal, dal roti and in popular snacks like sattu, besan ke laddo, besan sev etc. All these are regularly consumed in wide variety of cuisines in different part of the country. Sattu is considered an 'Instant' food made by preparing flour from roasted chickpea and barley or wheat since the time of the Rig Veda (8000BC) and often used by common people living in adverse conditions. Pulses are source of constant supply of nutrition round the year and nutritional value of pulses per 100 gram is much higher than any other vegetarian food. Presence of anti-nutritional factors (ANF) limits the utilization of pulses but the same ones also act as bioactive substances exhibiting significant favourable effects on health in reducing the risks for coronary heart disease, diabetes and obesity. Hence food technologists are trying to explore them as functional foods and nutraceuticals. Inherent capacity to fix atmospheric nitrogen and the ability to increase the soil fertility and decrease the use of expensive chemical nitrogenous fertilizers make cultivation of pulses a good fortune for farmers also.

Several traditional, fermented, deep fried, sweetened, puffed products and popular Indian snack items like idli, dosa, besan sev, dhokla, cheela, pakodas, and sweets like laddoo and burfi contain one of the ingredients from pulse variety. Incorporation of chickpea flour or besan increases the mineral and fiber content of pasta and reduces the glycemic response and supports development of low GI pasta and spaghetti. Addition of chickpea and lentil flours in bread, snacks, and chips not only

increased the bioavailability of nutrient but also improved the sensory and textural properties of the product and thus consumer acceptability. Though chickpea flour has poor shelf life and keeping qualities due to high fat content but this fat content is advantageous to improve binding of structure; flavour retention and mouth feel of the food products. Favourable nutritional and functional properties of cowpea and horse gram flours could also be exploited in the development of bakery products, soups, extruded products and ready-to-eat snacks. Technological processing may evoke positive effects like protein coagulation, starch swelling and gelatinization, texture softening and formation of aroma components. Technological processing and bio-fortification in different doses on pea plant improved in nutrition composition, antioxidant capacity, chlorophylls content and soluble sugars by several folds which can support developing attractive, convenient, ready-to-eat and tasty legume-based food formulations as per consumer demand.

With the increased commercialization of pulses value added products, the demand for it in the coming years is going to multiply due to growing demographic pressure and Increasing Economic growth. India has a large Vegetarian population which relies on pulses as a major source of protein. Thus the supply to catch up with the growing demand as of now seems a distant dream. Thus a Twin Strategy needs to be adopted. The focus on the horizontal as well as vertical expansion of pulses production should regain focus and secondly, long term Strategic alliances should be formed with Countries like Myanmar and Canada, Turkey, Tanzania from which India Imports nearly half of its Imported pulses. The concerted effort also is required in the supply chain management of the pulses which could adequately answer to the requirements of all stakeholders. Thus, we can see that all the factors of the pulses industry – right from the production to consumption along with value addition is all deeply inter related. So, a well-designed and planned supply chain management approach is a must to provide a win-win situation for the producers, intermediaries and consumers is a must for long-term sustainability of Pulses Industry.

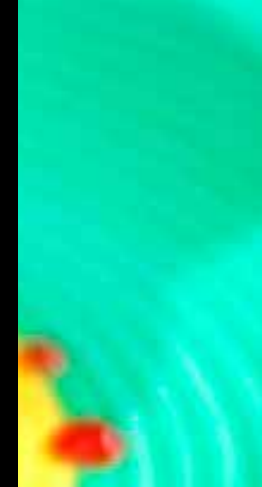
Dr. Hanish Kumar Sinha, Agri – Business  
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Select Recipes



The Pulse of Food





## KADALAKKA



### INGREDIENTS

- 3 Tbsp Chana Dal
- 1/4 Cup Milk
- 5 Eggs
- 3 Tbsp Sugar
- 1 Tsp Vanilla Powder / Cardamom Powder
- 1 Tbsp Cashew Nuts and Raisins
- 1 Tbsp Ghee

### DIRECTIONS

Soak chana dal in water for 2 hours and drain it. Grind chana dal with milk to make smooth paste. In a bowl add 2 eggs and 3 egg yolks. Beat with mixer then add sugar, vanilla powder to it and beat until sugar dissolve. In a separate bowl add 3 egg whites and whip to make white, fluffy cream. Add chana dal paste into egg yolk mix and carefully add whipped egg whites. Mix slowly by folding. Heat pressure cooker at low flame and add 1 tsp of ghee. Add chana dal egg mix into cooker and close the lid (don't place weight on it). In a separate pan add ghee and fry cashew nuts and raisins. After 3 minute open the pressure cooker lid and add cashew nuts and raisins on top of it. Close the lid and cook at low flame until steam comes out though the nozzle or till an inserted tooth pick comes out clean.



## BLACK BEAN TOSTADAS



### INGREDIENTS

- 2 Tbsp Olive Oil
- 1 Cup Chopped Onion
- 1 Jalapeno Pepper Diced (Use Less For Less Heat)
- 2 Garlic Cloves, Minced
- 2 Cups Cooked Black Beans or 1 540ml Can, Rinsed
- 1 Cup Chopped Tomatoes
- 1 Tbsp Orange Juice
- 1 Tsp Ground Cumin
- 1 Tsp Ground Coriander
- 1 Tsp Dried Oregano
- 1/2 Tsp Chili Powder
- 2 Tbsp Water
- 1/2 Cup Chopped Cilantro
- Salt And Pepper To Taste
- 8 Corn Tortillas
- 1 Cup Shredded Cheddar Cheese
- Guacamole, Salsa, Sour Cream, Cilantro to Serve

### DIRECTIONS

In a saucepan over medium-high heat, add the oil. Stir in the diced onion and sauté for 5 minutes, until the onion is translucent. Stir in the chopped jalapeno pepper, and cook for another minute. Stir in the garlic and cook for 30 seconds. Stir in the black beans, tomatoes, orange juice, spices and water. Cover, reduce heat to low and cook for about 25 minutes, stirring occasionally. If the mixture seems too thick, add a bit more water. Stir in the cilantro and season with salt and pepper. Let the mixture cool down for 15 minutes. Preheat the oven to 425F. Line two baking sheets with parchment paper. Arrange 4 corn tortillas per sheet. Spread about 1/3 of a cup of black bean filling on top of the corn tortilla, leaving about a 1/2 inch border. Top each with shredded cheddar. Bake for 5 minutes, then rotate pans from bottom to top, and bake another 5 minutes. Serve with guacamole, salsa, sour cream and extra cilantro, if you like. Leftover black beans keep well in the fridge for up to 5 days, or can be frozen for up to 1 month. Makes 8 tostadas.



## LENTIL PANCAKE BURGER



### INGREDIENTS

#### LENTIL BURGER

- 1 Tbsp Oil
- 2 Tsp Finely Chopped Garlic
- 2 Tsp Finely Chopped Ginger
- 1 Tbsp Finely Chopped Onion
- 1 Tsp Finely Chopped Green Chilli
- 1 Tsp Finely Chopped Celery
- Salt to Taste
- 1 1/2 Tbsp Finely Chopped Carrots
- 1 1/2 Tbsp Finely Chopped French Beans
- 2 Tbsp Boiled and Grated Potato
- 1/2 Cup Boiled Mixed Lentils
- 1 Tbsp Breadcrumb
- 2 Tsp Chopped Coriander
- 2 Tsp Oil to Pan Sear
- 3 - 4 Sliced Onions
- 1/2 Sliced Tomato
- 1/2 Cucumber Slices
- 2-3 Gherkins

#### PANCAKE BATTER

- 1/2 Cup Refined Flour
- 1 1/2 Tbsp Gram Flour
- 1/2 Tsp Turmeric Powder
- Crushed Black Pepper to Taste
- Salt to Taste
- 1/2 Cup Milk
- 1 Tsp Baking Soda

### DIRECTIONS

In a pan add oil, finely chopped garlic, finely chopped ginger, finely chopped onion, finely chopped green chilli, finely chopped celery, salt, finely chopped carrots and finely chopped french beans and sauté. For the filling; in a bowl add the sautéed vegetables, boiled and grated potato, boiled mixed lentils, breadcrumbs and chopped coriander and mix. To make the pancake batter; in a bowl add refined flour, gram flour, turmeric powder, crushed black pepper, salt, milk and baking soda and whisk. In a hot pan add oil. Make a patty of the filling and pan sear it from both sides. In another pan add the batter and make a pancake. Once cooked, remove and cut with a ring mould. Make one more. Place one pancake on a plate. Add sliced onion, prepared patty, sliced tomato, sliced cucumber and gherkins and cover with the other pancake to make a burger. Serve the lentil pancake burger with tomato ketchup.



## APPLE CAKE WITH CHICKPEAS



### INGREDIENTS

#### GARNISHES

5 cups of apples, peeled,  
cored and chopped into small chunks  
3 tbsp sugar, 1 tbsp cinnamon

#### CAKE

1 can of chickpeas, rinsed and drained  
3 large eggs, 1/2 cup butter  
1 1/4 cup canola oil, 1 tbsp vanilla  
2 cup all-purpose flour, 2 tbsp milk  
1 tbsp baking powder, 1 tsp cinnamon  
1/4 tsp nutmeg, 1 1/2 tsp salt

### DIRECTIONS

Preheat the oven to 350°F.

Toss prepared apples with sugar, cinnamon, and nutmeg. Set aside. Process chickpeas and eggs in a food processor or blender until smooth and set aside. In a large mixing bowl, beat butter, canola oil, and brown sugar until well combined. Add the chickpea mixture and vanilla and beat again. In a medium bowl, stir together the flour, baking powder, cinnamon, nutmeg, and salt. Add half the flour mixture to the butter mixture, and beat until just combined. Add milk, and beat again, then the rest of the flour mixture, and beat until just combined. Butter and flour a 9 x 13 in (22 x 33 cm) pan. Spread batter out in pan. Pour apple mixture evenly overtop, then press into the batter with back of a large spoon until batter just starts to press up through the apples. Bake in the middle of the oven for about 55-60 minutes, or until a tester inserted in the center comes out clean. Cool completely before cutting into 18 pieces. Dust slices with icing sugar before serving.

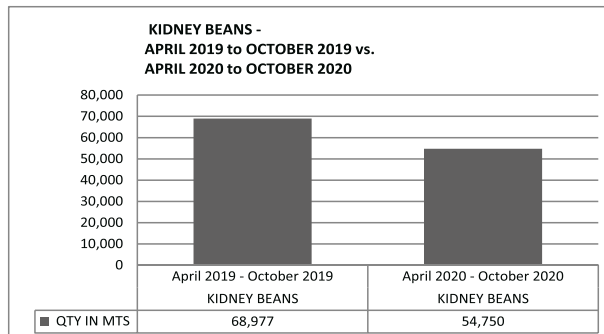
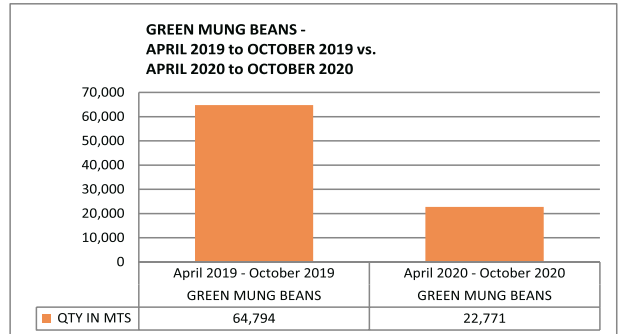
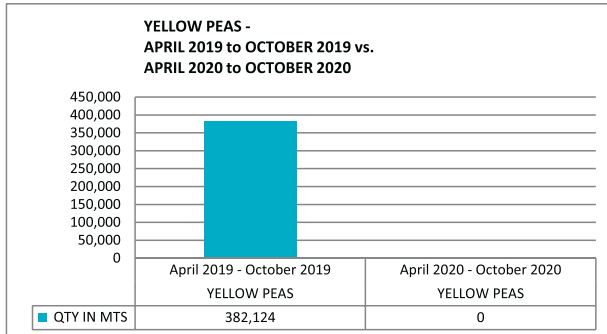
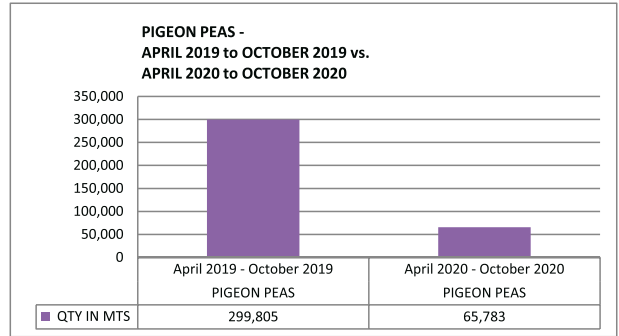
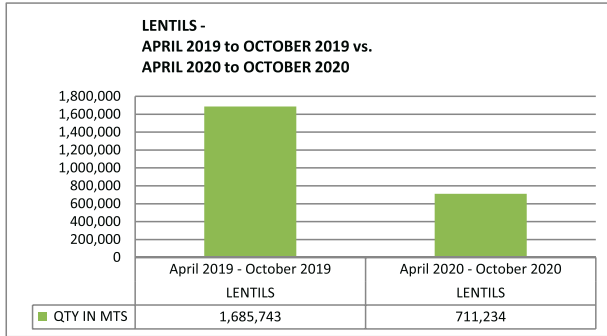
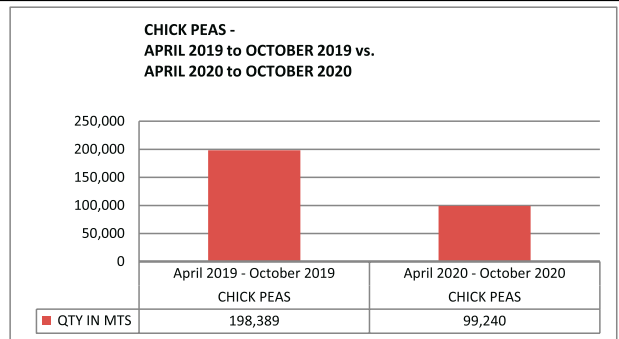
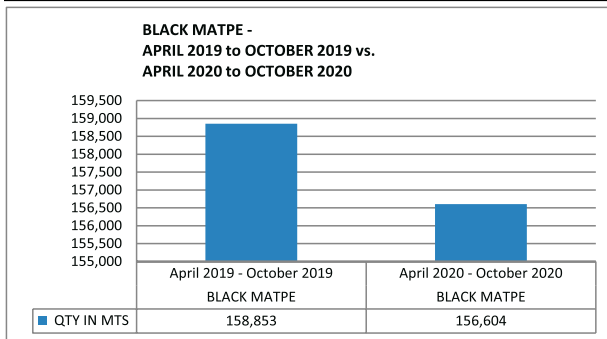
### RECIPE NOTES

1 (14 oz/398 mL) can chickpeas, rinsed and drained equals about 1 1/4 cups (310 mL) cooked chickpeas.



# Pulses Import Data Apr-Oct 2019 v/s Apr-Oct 2020

Nikita Chury  
IPGA



(Source: Import Manifest)

# Dalal Satish Damodar Upadhyay

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**Ministry of Agriculture and Farmers Welfare**  
**Department of Agriculture, Cooperation and Farmers Welfare**  
**Directorate of Economics and Statistics**  
**First Advance Estimates of Production of Foodgrains for 2020-21**

as on 22.09.2020  
(in Million Tonnes)

Crop	Season	2020-21																	
		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Target	1st Advance Estimates	
Rice	Kharif	78.27	80.17	82.66	84.91	75.92	80.65	92.78	92.36	91.50	91.39	91.41	96.30	97.14	102.04	101.98	102.60	102.36	
	Rabi	13.52	13.18	14.03	14.27	13.18	15.33	12.52	12.87	15.15	14.09	13.00	13.40	15.62	14.44	16.45			
	Total	91.79	93.36	96.69	99.18	89.09	95.98	105.30	105.23	106.65	105.48	104.41	109.70	112.76	116.48	118.43	102.60	102.36	
Wheat	Rabi	69.35	75.81	78.57	80.68	80.80	86.87	94.88	93.51	95.85	86.53	92.29	98.51	99.87	103.60	107.59			
	Kharif	4.07	3.71	4.11	3.05	2.76	3.44	3.29	2.84	2.39	2.30	1.82	1.96	2.27	1.74	1.64	2.15	1.75	
	Total	73.42	79.52	82.68	83.73	83.56	90.31	98.17	96.35	98.24	88.83	94.11	100.47	102.13	105.34	109.23			
Bajra	Total	7.63	7.15	7.93	7.25	6.70	7.00	5.98	5.28	5.54	5.45	4.24	4.57	4.80	3.48	4.73	2.15	1.75	
	Kharif	7.68	8.42	9.97	8.89	6.51	10.37	10.28	8.74	9.25	9.18	8.07	9.73	9.21	8.66	10.28	9.57	9.23	
	Rabi	2.35	1.44	2.15	2.04	1.89	2.19	1.93	1.57	1.98	2.06	1.82	1.39	1.99	1.24	1.74	2.35	1.58	
Small Millets	Kharif	0.47	0.48	0.55	0.44	0.38	0.44	0.45	0.44	0.43	0.39	0.39	0.44	0.44	0.33	0.40	0.65	0.40	
	Kharif	14.58	14.05	16.79	14.42	11.54	16.44	15.95	13.59	14.06	13.93	12.10	13.52	13.91	11.97	14.06	14.72	12.96	
	Rabi	3.56	3.44	3.81	4.19	3.93	3.56	2.69	2.44	3.15	3.15	2.42	2.60	2.53	1.74	3.09			
Maize	Total	18.14	17.50	20.60	18.62	15.47	20.01	18.64	16.03	17.20	17.08	14.52	16.12	16.44	13.71	17.15	14.72	12.96	
	Kharif	12.16	11.56	15.11	14.12	12.29	16.64	16.49	16.20	17.15	17.01	16.05	16.92	20.12	19.41	19.63	22.00	19.88	
	Rabi	2.55	3.54	3.85	5.61	4.43	5.09	5.27	6.05	7.11	7.16	6.51	6.98	8.63	8.30	9.01			
Barley	Total	14.71	15.10	18.96	19.73	16.72	21.73	21.76	22.26	24.26	24.17	22.57	25.90	27.72	28.64	28.64	22.00	19.88	
	Kharif	26.74	25.61	31.89	28.54	23.83	33.08	32.44	29.79	31.20	30.94	28.15	32.44	34.03	31.38	33.69	36.72	32.84	
	Rabi	7.33	8.31	8.86	11.49	9.72	10.32	9.58	10.24	12.09	11.92	10.37	11.33	12.94	11.67	13.79			
Cereals	Total	34.07	33.92	40.75	40.04	33.55	43.40	42.01	40.04	43.30	42.86	38.52	43.77	46.97	43.06	47.48	36.72	32.84	
	Kharif	105.01	105.78	114.55	113.45	99.75	113.73	125.22	122.15	122.70	122.34	119.56	128.74	131.16	133.42	135.67	139.32	135.21	
	Rabi	90.21	97.30	101.46	106.45	103.70	112.52	116.98	116.63	123.09	112.53	115.66	123.24	128.44	129.71	137.83			
Tur	Total	195.22	203.08	216.01	219.90	203.45	226.25	242.20	238.78	245.79	234.87	235.22	251.98	259.60	263.14	273.50	139.32	135.21	
	Kharif	2.74	2.31	3.08	2.27	2.46	2.86	2.65	3.02	3.17	2.81	2.56	4.87	4.29	3.32	3.83	4.82	4.04	
	Rabi	5.60	6.33	5.75	7.06	7.48	8.22	7.70	8.83	9.53	7.33	7.06	9.38	11.38	9.94	11.35			
Gram	Kharif	0.90	0.94	1.12	0.84	0.81	1.40	1.23	1.50	1.15	1.28	1.25	2.18	2.75	2.36	1.30	2.90	2.15	
	Rabi	0.35	0.50	0.34	0.33	0.42	0.36	0.53	0.47	0.55	0.68	0.70	0.66	0.74	0.70	0.74			
	Total	1.25	1.44	1.46	1.17	1.24	1.76	1.77	1.97	1.70	1.96	1.95	2.83	3.49	3.06	2.04	2.90	2.15	
Moong	Kharif	0.69	0.84	1.25	0.78	0.44	1.53	1.24	0.79	0.96	0.87	1.00	1.84	1.43	1.78	1.79	1.88	2.09	
	Rabi	0.26	0.28	0.27	0.26	0.25	0.27	0.40	0.40	0.65	0.64	0.59	0.52	0.59	0.87	0.67			
	Total	0.95	1.12	1.52	1.03	0.69	1.80	1.63	1.19	1.61	1.50	1.59	2.17	2.02	2.46	2.46	1.88	2.09	
Lentil	Rabi	0.95	0.91	0.81	0.95	1.03	0.94	1.06	1.13	1.02	1.04	0.98	1.22	1.62	1.23	1.18	1.00	1.03	
	Kharif	0.54	0.70	0.96	0.80	0.49	1.33	0.93	0.61	0.71	0.78	0.72	0.89	0.83	0.63	0.81			
	Total	1.36	1.37	1.19	1.28	1.28	1.33	1.34	1.59	1.52	1.74	1.47	1.77	1.78	1.45	1.50	10.60	9.31	
Other Rabi Pulses	Kharif	4.86	4.80	6.40	4.69	4.20	7.12	6.06	5.92	6.00	5.73	5.53	9.58	9.31	8.09	7.72	10.60	9.31	
	Rabi	8.52	9.40	8.36	9.88	10.46	11.12	11.03	12.43	13.26	11.42	10.79	13.55	16.11	13.98	15.44			
	Total	13.38	14.20	14.76	14.57	14.66	18.24	17.09	18.34	19.26	17.15	16.32	23.13	25.42	22.08	23.15	10.60	9.31	
Total Foodgrains	Kharif	109.87	110.58	120.96	118.14	103.95	120.85	131.27	128.07	128.69	128.07	125.09	138.33	140.47	141.52	143.38	149.92	144.52	
	Rabi	98.73	106.71	109.82	116.33	114.15	123.64	128.01	129.05	136.35	123.96	126.45	136.78	144.55	143.70	153.27			
	Total	208.60	217.28	230.78	234.47	218.11	244.49	259.29	257.12	265.05	252.02	251.54	275.11	285.01	285.21	296.65	149.92	144.52	

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