

GOVERNMENT OF INDIA  
MINISTRY OF AGRICULTURE AND FARMERS WELFARE  
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION

**LOK SABHA**  
**UNSTARRED QUESTION NO. 1349**  
TO BE ANSWERED ON 18/12/2018

**POTATO RESEARCH AND EXPORT CENTRES**

1349. SHRI S.R. VIJAYAKUMAR:  
SHRI ASHOK SHANKARRAO CHAVAN:  
KUNWAR HARIBANSH SINGH:  
SHRI S. RAJENDRAN:  
SHRI T. RADHAKRISHNAN:  
SHRI SUDHEER GUPTA:

Will the Minister of AGRICULTURE AND FARMERS WELFARE  
कृषि और किसान कल्याण मंत्री be pleased to state:

- (a) the number of potato research centre and potato export centre which are functioning in the country at present, State/UT-wise;
- (b) the aims and objectives of the said centres along with their achievements made since their inception;
- (c) the amount of funds allocated by the Government to the said centres during each of the last three years and the current year, centre-wise;
- (d) the quantum of potato produced in the country at present, State/UT-wise;
- (e) whether the Government has provided any special incentive scheme to the farmers to encourage cultivation of potato in the country and if so, the details thereof; and
- (f) the other steps taken/being taken by the government to increase the production of potato and its export from the country?

**A N S W E R**

MINISTER OF STATE IN THE MINISTRY OF AGRICULTURE AND FARMERS WELFARE  
कृषि और किसान कल्याण मंत्रालय में राज्य मंत्री  
(SHRI PARSHOTTAM RUPALA)

- (a) ICAR-CPRI, Shimla is a non-profit scientific institution under the aegis of Indian Council of Agricultural Research working exclusively on potato. Presently it has Headquarters at Shimla and seven regional research centres in different potato growing areas of the country.

These are located in following places:

1. Modipuram (Uttar Pradesh)
2. Kufri-Fagu (Himachal Pradesh)
3. Jalandhar (Punjab)
4. Gwalior (Madya Pradesh)
5. Patna (Bihar)
6. Shillong (Meghalaya)
7. Ootacamund (Tamil Nadu)

(b) The aims and objectives of the Institute and its centres as a whole are given as under:

### **Aims/Mandate**

- Basic strategic and applied research to enhance sustainable productivity, quality and utilization of potato.
- Repository of genetic resources and scientific information on potato.
- Transfer of technology, capacity building and impact assessment of technologies.
- Disease-free nucleus and breeder seed potato production.
- Coordinate research and validation of technologies through AICRP on potato.

### **Objectives**

- Pre-breeding using conventional and somatic hybridization technology for development of elite populations/ genotypes.
- Characterization and evaluation of the germplasm for important traits and their utilization for development of improved varieties with desired traits.
- Diversity analysis, identification of new genes, alleles and their utilization for development of cultivars using biotechnological tools and techniques.
- Production system management for enhancing productivity of water and nutrients.
- Technologies for climate resilient production system.
- Patho-genomics and plant health management utilizing diagnostics and bio-intensive management of pests and diseases including forecasting.
- Vector dynamics and enhancing production of quality planting material.
- Farm mechanization, post-harvest management, value addition and secondary horticulture.
- Human resource development.

### **Major Achievements**

During last 68 years of its existence, the institute developed need-based technologies that triggered a revolution in potato production on account of very fast growth in area and productivity. A few breakthrough technologies and major achievements of CPRI that helped in sustainable growth of the potato crop in India are listed below.

## **Crop improvement**

- Partnered with 26 international institutes belonging to 14 countries in deciphering the complex potato genome.
- Developed and released 57 potato varieties with different traits *viz.* late blight resistance, heat tolerance, processing quality (6 varieties), multiple resistances to diseases and increased yield.
- Developed & registered 23 improved breeding lines as elite genetic stocks having earliness, resistance to pest & disease and frost tolerance.
- Developed two interspecific somatic hybrids of potato *Solanumtuberosum* dihaploid C-13 (+) *S. etuberosum*, and C-13 (+) *S. pinnatisectum* resistant to Potato Virus Y and late blight through protoplast fusion to overcome the sexual barriers.
- Developed transgenic potatoes with important agronomic traits *viz.*, late blight durable resistance, reduction of cold induced sweetening, high protein content, resistance to Potato Virus Y, Potato Apical Leaf Curl Virus, Potato Tuber Moth, and altered plant architecture.
- Identified potato genotypes having multiple resistance genes for Late Blight (*RI&R3*), Potato Virus Y (*Ryadg*) & Cyst Nematodes (*HC, HI&Gro1*) using molecular markers.

## **Plant protection**

- Developed late blight forecasting model.
- Developed and standardised virus detection and diagnostic techniques including dipstick assay for all important viruses.
- Replaced hazardous organomercurials chemical with the safe boric acid (3%) in seed treatment to check soil and tuber borne diseases particularly black scurf and common scab.
- Developed IPM for management of all important diseases and pests.

## **IT, GIS and Remote Sensing**

- Developed a decision support system “Computer Aided Advisory System for Potato Crop Scheduling” (CAASPS) which helps to decide the time of planting/ harvesting considering the expected yields of different varieties planted in different times in most of the potato growing regions of the country.
- A methodology for estimation of potato acreage and production in the northern Indo-Gangetic plains using crop modelling, remote sensing and GIS has been developed in collaboration with Space Applications Centre (ISRO), Ahmedabad.

## **Seed technology**

- Development of Seed Plot Technique which enabled seed potato production in sub-tropical plains.
- Annual production of about 30000 q breeder seed of about 25 commercial varieties to facilitate supply of quality potato planting material in the country.
- Developed aeroponic technique for production of healthy seed potato.

## Crop production

- Developed resource management strategies for major potato based cropping systems involving sequential and intercropping systems in different parts of the country to sustain the productivity of potato crop.
- Developed nutrient use efficient (NPK and water) potato variety Kufri Gaurav.
- Standardised fertigation system for potato which economises on water by 40-50% and fertilizer N, P and K by 25-30% in comparison to conventional furrow irrigation besides 20-30% increase in potato yield.

## Social sciences

- Carried out impact assessment of potato technologies to estimate socio-economic returns to research investments.
- Dissemination of potato technologies through various extension programmes was undertaken at CPRI in order to bridge yield gap across the country.

## Storage technology

Developed elevated temperature and on-farm storage technologies for storing table and processing potatoes.

(c) The council allocates consolidated funds for the Institute and Institute releases funds to its centres as per their requirement. The detail of funds allocated to the Institute during each of the last three years is as under:

<i>Amount in Lakhs</i>		
<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
5870.64	6435.00	6256.00

(d) State/UT wise production is given in **Annexure-I**.

(e) ICAR-CPRI Headquarter at Shimla with its seven Regional Stations and 25 AICRP centres is a nationwide network located in distinct agro-climatic regions of the country catering to the needs of research and development of potato. The technologies and varieties developed by the institute along with AICRP on Potato are being disseminated to the farmers. Breeder seeds produced by the institute reach to the farmers through seed chain facilitated by Government agencies which benefit the farmers to avail quality planting material. Following are the facilities available with CPRI for the benefit of farmers of potato in the country:-

- The institute has been awarded National Accredited Test Laboratory for Certification of virus free and true to type tissue culture microplants of potato by the Department of Biotechnology, Government of India. Farmers/potato growers can avail the facility of testing planting material.
- The institute has developed technology of Aeroponics for rapid multiplication of quality planting material. The technology has been commercialized.

- Institute has clear roadmap for developing potato varieties with multiple disease resistant exploiting parents having different resistant genes through MAS.
- Till now institute has developed and released 50 potato varieties with different traits viz. late blight resistance, heat tolerance, processing quality (6 varieties), multiple resistances to diseases and increased yield for the benefit of farmers and potato growers.
- Institute has developed technology on Micro-irrigation in potato. The technology has been adopted by potato farmers in different parts of the country, however, Gujarat may be considered a role model for adoption of modern methods of irrigation as the state has the highest adoption of micro-irrigation technology in potato crop. Consequently Gujarat has the highest potato productivity in India.
- Institute has developed a decision support system “Computer Aided Advisory System for Potato Crop Scheduling” (CAASPS) which helps to decide the time of planting/harvesting considering the expected yields of different varieties planted in different times in most of the potato growing regions of the country.
- Institute produces 30000 q of breeder seed annually on 25 commercial varieties to facilitate supply of quality potato planting material in the country.
- Institute carries out impact assessment of potato technologies to estimate socio-economic returns to research investments.
- Institute disseminates potato technologies through various extension programmes undertaken at CPRI in order to bridge yield gap across the country.
- Institute has developed elevated temperature and on-farm storage technologies for storing table and processing potatoes, the benefit of which farmers can take through training and on farm demonstration.

(f) The other steps taken/being taken by the Government to increase the production of potato and its export from the country are as follows:-

- APEDA provides financial assistance to exporters for setting up of integrated pack houses at par with the standards of international requirements. Assistance is also provided for setting up of quality labs, Quality Certification, HACCP, ISO, GAP etc to exporters.
- Under the cluster development programme of Gujarat, APEDA has arranged training programmes for implementation of GAP Certification, on pre and post harvest practices on potatoes in the districts of Gandhinagar, Sabrakantha, Mehsana in March 2018.
- APEDA has got developed the packaging standards for potatoes in bulk packing in jute, leno and corrugated boxes through Indian Institute of Packaging for the benefit of exporters.
- Registered member exporters of APEDA including that of potato are encouraged to participate in exhibitions abroad.

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**Production of potato in India (States/UTs-wise)**

(Production in '000 Tonnes)

STATES/UTs	2016-17	2017-18 (2 <sup>nd</sup> A. E.)	
	Production	Production	% Share
UTTAR PRADESH	15543.00	15555.53	30.91
WEST BENGAL	11052.60	12332.50	24.50
BIHAR	6377.71	6377.71	12.67
GUJARAT	3797.82	3835.79	7.62
MADHYA PRADESH	3461.09	3537.49	7.03
PUNJAB	2423.00	2570.67	5.11
HARYANA	896.95	1095.90	2.18
ASSAM	777.83	1072.78	2.13
JHARKHAND	668.66	688.77	1.37
CHHATTISGARH	678.57	684.63	1.36
KARNATAKA	507.64	421.86	0.84
UTTARAKHAND	360.37	360.54	0.72
ODISHA	302.22	298.06	0.59
MAHARASHTRA	536.62	262.60	0.52
RAJASTHAN	234.55	235.00	0.47
MEGHALAYA	193.68	229.90	0.46
HIMACHAL PRADESH	202.44	200.00	0.40
TRIPURA	143.58	144.46	0.29
JAMMU & KASHMIR	130.84	132.15	0.26
SIKKIM	53.51	107.10	0.21
NAGALAND	65.59	65.02	0.13
ANDHRA PRADESH	49.11	53.09	0.11
TAMIL NADU	92.73	42.67	0.08
KERALA	5.30	4.50	0.01
MIZORAM	1.00	0.93	0.00
TELANGANA	32.78	0.30	0.00
OTHERS	15.40	17.05	0.03
<b>TOTAL</b>	<b>48604.57</b>	<b>50327.02</b>	<b>100.00</b>

**Source:** State Department of Horticulture & Agriculture

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