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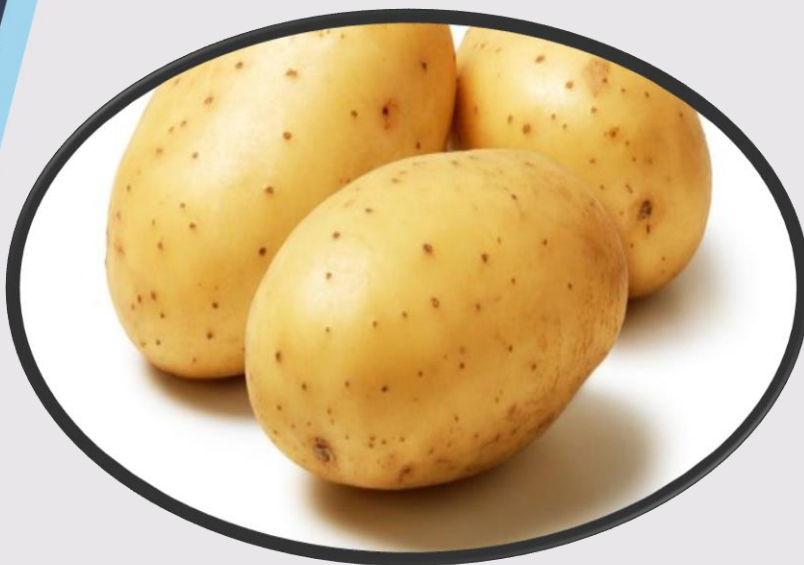
# **PRODUCTION TECHNOLOGY OF POTATO**

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## **GENERAL CHARACTERISTICS:**

- Scientific name: *Solanum tuberosum*
- Family : Solanaceae
- Chromosome no:  $2n=48$  (autotetraploid)
- **Centre of origin: South America**
- International year of potato-2008

## **IMPORTANT RESEARCH STATION RELATED TO POTATO:**

- **Central Potato Research Institute (CPRI), Kufri, Shimla**
- International Potato Centre(CPI), Lima , Peru



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## IMPORTANCE AND NUTRITIVE VALUE:

- Potato is highly nutritious, easily digestible and whole some food.
- A glycoalkaloid called **solanin**(5mg/100g) is found
- Rich source of carbohydrate and Vitamin A
- Some amount of protein(1.6%) is also found
- It is processed into chips, french fries and canned foods
- Potato **starch(farina)** used in textile industries
- Alcohol prepared from potato-Vodka

## AREA AND DISTRIBUTION:

- In India, Uttar Pradesh is the largest producer followed by West Bengal.
- In World, China is the leading producer followed by India(Production).



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## BOTANY:

- Fruit type- berry
- Flower- hermaphrodite
- self pollinated crop

## CLASSIFICATION OF POTATO BASED ON MATURITY:

### Groups

### Name of variety

Early (2-2<sup>1/2</sup> months from sowing to harvest)

**Kufri Chandramukhi**, Kufri Chamatkar, Kufri Alankar, Kufri Ashoka

Mid(2<sup>1/2</sup>-4<sup>1/2</sup> months from sowing to harvest)

Kufri Kisan, Kufri Sindhuri, Kufri Lalima,

Late(4<sup>1/2</sup>-5<sup>1/2</sup> months from sowing to harvest)

Kufri Safed, Kufri Jeevan, Kufri Neela



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## Important Characteristics

Resistant to late  
blight

Processing  
varieties

Resistant to  
golden cyst  
nematode

Resistant to frost

## Variety name

**Kufri Badshah**, Kufri jyoti,  
Kufri Kanchan, Kufri Himsona

Kufri Chipsona 1, Kufri  
Chipsona 2, Kufri frysona,  
**Kufri surya**

Kufri Swarna, Kufri Dewa

Kufri Sheetman, Kufri  
Chipsona 2



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## PRODUCTION TECHNOLOGY

### CLIMATE:

- Cool season crop so low temperature, low humidity and bright sunny days are required.
- Temp. for **germination of tuber 25<sup>0</sup>C**
- Temp. for **vegetative growth 20<sup>0</sup>C**
- Temp. for **tuber growth 17-19<sup>0</sup>C**
- Annual rainfall of 120-200 cm

### SOIL:

- friable, porous, well drained **sandy loam to clay loam soil.**
- pH -5.5 to 6.5



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## **PLANTING SEASON:**

- In Kharif season, end of june to early july
- In rabi season, early november

## **PROPAGATION:**

- vegetatively propagated using seed tubers
- seed rate-1500-2000kg/ha
- large tubers are cut and make in 2 halves
- weight of seed tuber-30-40 gms
- diameter of seed tuber- 3.5-5 cm
- cut tubers are covered with gunny bags for 2-3 days for suberization, otherwise it will rot.





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## **PRE SPROUTING:**

- It has a tuber dormancy for 8-10 weeks, so seed tubers are stored
- seed tubers after removing from cold storage should be kept in diffused light for 10-15 days to develop short, thick and green sprouts.
- **Tubers treated with 1% thiourea + 1 ppm GA<sub>3</sub> for 1 hr.**

## **METHOD OF PLANTING:**

- Ridge and furrow
- spacing- 60 cm x 20 cm
- sprouted tubers are planted in furrows at 20-25 cm sprout facing upwards
- furrow are made at 60 cm distance
- cover the tubers by making ridges at 15 cm ht over furrows.





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## MANURES AND FERTILISERS:

- FYM-15-30 t/ha
- NPK: 125:100:125 Kg/ha NPK
- Basal- N1/2 + full P + Full K
- Top dressing-rest ½ N (30 days)

## IRRIGATION:

- potato has **high water requirement** for good growth and development
- First irrigation given immediately after planting
- Subsequent irrigation at 8-10 days interval
- crop should be protected from moisture stress during stolon initiation and tuberisation otherwise it may delay maturity of crop.



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## INTERCULTURE:

### ■ Weeding-

- ❖ 1<sup>st</sup> immediately before earthing up
- ❖ 2<sup>nd</sup> 50-60 days after planting
- ❖ Pre emergence weedicide-alachlor, simazine and to be applied within five days of planting.

### ■ Earthing up-

- ❖ done about 25 days after planting.
- ❖ helps in **better tuber development** and **avoid potato tuber moth**
- ❖ if left exposed to sunlight they will start to synthesize anthocyanin and chlorophyll and the chlorophyll checks accumulation of starch in tubers resulting in small tubers with bitter taste due to solanin.



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## **TUBER FORMATION:**

- potato bears tubers at stolon end
- stolon arises from lower nodes and starts to form 20-25 days after planting
- usually, tubers start to form in about 30-35 days after planting from apical and sub apical region of stolon.

## **DEHAULMING:**

- this is a cutting operation which is practised 10-12 days before harvesting to help potato skin to mature quickly by removing active haulms once potatoes reach maturity
- very essential for seed potatoes and to store in cold storages.
- in this irrigation is stopped 10 days prior to haulming.



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## HARVESTING:

- Time of harvesting of potato depends upon variety and weather conditions
- complete drying of the plant
- crop duration varies from 75 days to 170 days
- **Kharif crops come to harvest during end of september to early october**
- **Rabi crops by the end of january and early february**

## YIELD:

- Early type-20-25 t/ha
- Late-30-35 t/ha



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## **Why to go for TPS (True potato seed)**

- This technique was developed by Dr.S.Ramanujan
- TPS is the matured ovule of potato resulting from sexual fertilisation
- Seeds are raised in nursery and transplanted in main field.

## **Disadvantage of seed tubers:**

- Bulk nature is a problem for transportation which increases seed cost.
- Inadequate supply of seed tubers at an affordable cost
- Transmission of Viral diseases through tubers
- storage losses due to rotting of tubers



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## **Advantages of TPS:**

- required in small quantity 100-150gm/ha
- free from viral diseases
- storage loss of seed tubers can be avoided
- low pest and disease and low cost of production



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## PHYSIOLOGICAL DISORDERS:

Sl no.	Name	Cause
1.	Greening	<ul style="list-style-type: none"><li>■ Exposure to sunlight</li><li>■ Improper earthing up</li></ul>
2.	Internal brown spot	<ul style="list-style-type: none"><li>■ Moisture deficiency</li></ul>
3.	<b>Black heart</b>	<ul style="list-style-type: none"><li>■ <b>Poor ventilation</b></li></ul>
4.	<b>Hollow heart</b>	<ul style="list-style-type: none"><li>■ <b>Excessive nitrogen</b></li></ul>
5.	Chilling injury	<ul style="list-style-type: none"><li>■ Low temperature-0<sup>0</sup>C</li></ul>
6.	Freezing injury	<ul style="list-style-type: none"><li>■ Low temperature-1 to -2<sup>0</sup>C</li></ul>





Internal brown spot



Greening



Black heart  
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Hollow heart



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## DISEASES:

SI No .	Disease name	Symptoms	Remedy
1.	<b>Late blight</b> <b>(<i>Phytophthora infestans</i>)</b>	<b>Symptoms seen on all parts, Affected leaves appear blistered, in later stage leaves dry out and colour turns from brown to black, dark brown colour spots appear on skin of tuber.</b>	<b>Infected plant material should be destroyed, Spray dithane M-45 at 10-12 days interval, grow resistant var. like Kufri Navtal</b>
2.	Bacterial wilt ( <i>Ralstonia solanacerum</i> )	Symptoms seen all the parts of plant, infected plants begin to wilt, oozing out of fluid from tuber.	Destroy infected plant material, grow resistant variety
3.	Potato wart ( <i>Synchytricum endobioticum</i> ) 17	Greenish yellowish warty growth on base of stem, infected tubers also develop warty growth.	Soil sterilisation, grow resistant variety Kufri jyoti, Kufri Kanchnar

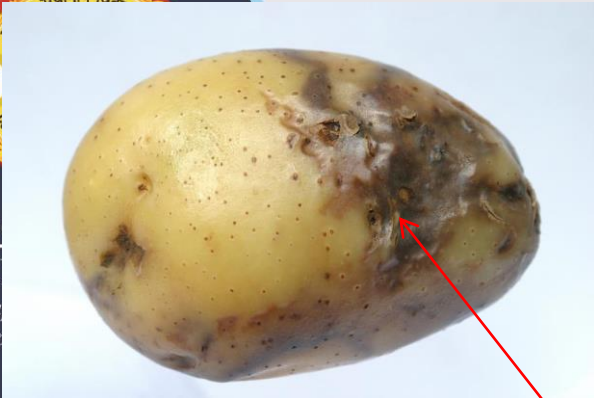


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SI No.	Disease name	Symptoms	Remedy
4.	Soft rot ( <i>Erwinia caratovora</i> )	Encouraged by cool damp conditions, lesions develop as well as tuber is damaged	Use quality seeds , avoid mechanical injury
5.	Potato scab ( <i>Streptomyces spp.</i> )	Cork like lesions appear on surface of tuber	Seed treatment with fungicides, Grow resistant var like Kufri Sutlej
6.	Leaf roll(PLR) (Virus) Transmitted by Aphid	Upward rolling of leaf margin of young leaves, affected leaves are slight pale to purplish in colour	Apply thiomethoxa m control aphid.





Late blight of potato



Bacterial wilt



Potato wart



Potato scab



Soft rot



Potato leaf roll





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# INSECT PEST

SI No	Pest name	Damage	Remedy
1.	Aphid ( <i>Myzus persicae</i> )	Leaf size become small, severe infestation results wilting	Apply thiomethoxam 600g/ha at the time o planting in furrows.
2.	Cut worm ( <i>Agrotis ipsilon</i> )	Damage both plant and tuber, bore holes in tuber	Clean cultivation, Apply Indoxacarb 130g/ha
3.	Potato tuber moth ( <i>Pthorimea opercullela</i> )	Caterpillars bore into the tuber and fill it with excreta	Timely earthing up, spray 0.1% carbaryl at 15 days interval



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