South America is known as origin place for potato but potato came in India in 17th century from Europe. Potato has 4th place in farm area after paddy, wheat and sugar cane. It is a crop which gives more yield per unit area as compared to other crops such as wheat, paddy and ground nut and income per hectare is also more. Potato contains mainly 80-82%, 14% starch, 2% sugar, 2% protein and 1% minerals. 0.1% fat and vitamin is also found in small quantity.

Improved Cultivation of Potato

Climate

Potato is sub tropical crop. In Uttar Pradesh, its cultivation in sub tropical condition is done in Rabi season. In normal condition, the temperature in day time should be 25-30 degree Celsius and in night, 4-15 degree Celsius. 18-20 degree Celsius temperature is best at the time of bulb formation. If the temperature is little higher at the time of bulb formation, the vegetative growth is better. But if the temperature is very high, bulb formation is stopped. Bulb formation is completely stopped if the temperature is more than 30 degree Celsius.

Land and land management

Potato can be grown in different types of crop where pH ranges from 6-8nbut sandy loam and loam having proper water drainage is suitable. Plough 3-4 times by disc harrow or cultivator. Use leveler after every plough so that the soil becomes fine and conserves moisture. At present, use of rotavator prepares the field early and well. For good yield, tillage is required before sowing.

Organic Manure

If green manure has not been used, use of 15-30 tons per hectare decomposed farm yard manure increases the biological matter which is helpful in increase in production of bulbs.

Manure and Fertilizer Management

Normally 180 kg nitrogen, 80 kg phosphorous and 100 kg potash is recommended. This quantity can vary on the basis of soil testing. There may be following alternative for supply of 180:80:100 kg nitrogen, phosphorous and potash.

Manure and fertilizer Management

Recommended Fertilizer	**Option-1 (With C.A.N)**		**Option-2 (With Urea)**		**Option-3 (With D.A.P)**		**Option-4**
	Fertilizer Name	**Qty(Kg)**	**Fertilizer Name**	**Qty(Kg)**	**Fertilizer Name**	**Qty(Kg)**	**Fertilizer Name**
1. Nitrogen A. At the time of sowing	Calcium ammonium	360	Urea	130	Urea DAP	128 174	Urea NPK

B. At the time of earth up	nitrate Urea		Urea	261	Urea	196	Urea
2 Phosphorous at the time of sowing	Single super phosphate	500	Single super phosphate	500	-	-	-
3 Potash at the time of sowing	Murrett of Potash	167	Murrett of Potash	167	Murrett of Potash	167	Murrett of Potash

Use fertilizer as per recommendations of soil testing or 25 kg zinc sulphate and 50 kg ferrous sulphate per hectare before sowing. Zinc sulphate can be spread also.

Seed

Department of Horticulture, Uttar Pradesh distributes first class foundation seed of potato. This seed can be used for 3-4 years.

Chitting potato seed of 30-55 mm diameter should be used for sowing. 30-35 quintal seed is required for 1 hectare. Selection of variety would be better on the basis of regional requirement and time of sowing such as early sown crop, main crop and late sown crop. Details of varieties recommended according to climatic conditions are detailed below:

SN	Crop	Potato Variety Name/strong>	Maturation Duration (In days)	Abhiyukti
	Early Crop			
1		quintal Chandramukhi	80-90	
2		quintal Pukhraj	60-75	
3		quintal Surya	60-75	
4		quintal Khyati	60-75	
5		quintal Alankar	65-70	
6		quintal Bahar 3792E.	90-110	
7		quintal Ashoka P. 376J.	60-75	
8		J.F.-5106	75-80	
	Main Crop			
1		quintal Navtal G. 2524	90-110	
2		quintal Bahar 3792E.	90-110	
3		quintal Anand	90-110	
4		quintal Badshah	90-110	
5		quintal Sinduri	90-110	
6		quintal Satluj J.-5857	90-110	
7		quintal Lalima	90-110	
8		quintal Arun	90-110	
9		quintal Sadabahar	90-110	

10		quintal	Pukhraj 90-110
	Early Crop:		
1		quintal	Satluj J.-5857 110-120
2		quintal	Badshah 110-120
3		quintal	Anand 110-120
	Processing Eligible Variety:		
1		quintal	Surya 100-120
2		quintal	Chipsona-1 100-120
3		quintal	Chipsona-3 100-120
4		quintal	Chipsona-4 100-120
5		quintal	Frisona 100-120

Sowing Time of Seed

Potato is very sensitive to temperature. 25-30 degree Celsius in day is suitable for vegetative growth and 15-20 degree Celsius temperature in night is suitable for growth of bulb. Normally early crop is sown from mid September to first week of October and sowing of main crop should be completed by mid October.

Sowing of Seed

If there is in sufficient moisture in the field, tillage is essential. Bulb of potato of seed size is sown in furrows. It is covered with soil and bunds are formed. Sowing of potato by potato planter can save labor and money.

Weed Control

Weeding and hoeing is essential to destroy the weeds.

Irrigation management

7-10 irrigation is required for proper growth and good yield. If tillage is not done before sowing, apply light irrigation within 2-3 days of sowing. Apply irrigation if the moisture in soil has reduced to 15-30%. Apply first irrigation after 8-10 days of sowing in sandy loam and loam soils and 10-12 days of sowing in heavy soil. If there is possibility of very low temperature or frost, irrigate immediately. Use of modern irrigation system such as Sprinkler and Drip irrigation System increases the water utilization capacity. In comparison to irrigation in furrows, sprinkler system can save 40% water and drip system up to 50% water and yield is also increased by 10-20%.

Insect and Disease Management

Many diseases and insects harm potato crop. Critical diseases and important insects are detailed below which harms the yield and quality of bulbs.

Late Blight

This is a dangerous disease caused by fungus in potato. The menace of this disease is found on all parts of potato such as leaves, stem and bulbs. The possibility of this disease is increased when the season becomes cloudy, the temperature ranges from 10-20 degree Celsius and relative humidity is 80%. Stop irrigation immediately. If it is required, apply light irrigation and spray 0.20% mancozeb solution at an interval of 8-10 days before the symptom of this disease appear.

Early Blight

Early blight affects both leaves and bulb. In the beginning, the symptoms of this disease appear on lower and older leaves in the form of oval shaped brown spots. On the infested bulbs, spots of press appear and the inner material becomes brown and dry. Hence select disease resistant variety. For control of this disease, use 0.3% of fungicides copper oxy chloride.

Potato Leaf Roll

This is a viral disease which spreads by PLRV. For this disease control, the seeds should be disease free and spray insecticides such as phosphomidan, 0.0% solution or methyloxydematon or dimethoat 0.1% solution 1-2 times in December and January for control of its vector aphid.

Termite

Mostly, menace of termite has been found in early crop. The leaves of infested plant roll downward. In case of intense menace, copper color spot appears on the lower surface of leaves. For prevention of termite, use dicofal 18.5 EC or quinolfos 25 EC at the rate of 2 liter per hectare with irrigation water at repeat it at an interval of 7-10 days.

Harvesting of Potato

Potato can be harvested after 60-70 days of sowing to fetch good prices from early sown crop when it is not ripened. When the crop is ripened, best time of digging potato is mid February to second week of March. Complete the digging before the temperature rises to 30 degree Celsius.

Storage of Potato

Recessive period of potato decides the storage. For different variety of potato, recessive period is different which 6-10 weeks after harvesting of potato. If the potato is to be sent in the market early, there is no need of its storage in cold store. For this, potato can be stored in shades and clean and airy houses. Central Potato Research Institute, Shimla has developed design of zero energy cool store for storage of potato for short duration in which potato can be stored for 70-75 days.