

Extension Bulletin No. 15 (E)

PACKAGE OF PRACTICES FOR TABLE AND SEED POTATO  
PRODUCTION IN NORTH WESTERN HILLS

ICAR

CENTRAL POTATO RESEARCH INSTITUTE

(Indian Council of Agricultural Research)  
SHIMLA 171 001, H.P.

Table and seed potato production in  
North-western hills

## TABLE POTATO PRODUCTION

### 1. Recommended cultivar

Kufri Jyoti is recommended for cultivation in the region.

### 2. Seed source

Seed should be procured from a reliable source, preferably from a reputed seed producing agency, like the State Agriculture/Horticulture Department, Seed Corporations, etc. If you are using home grown own seed, it is better to replace it every 3-4 years.

### 3. Seed size

35-45 grams.

### 4. Seed preparation

Preparation the seed obtained from the harvest of the previous main crop by keeping in baskets, or sprouting trays or spreading in a ventilated room to ensure proper sprouting. Remove unsprouted and rotted tubers periodically. Take well sprouted tubers to the field for planting in baskets or in sprouting trays to avoid damage to sprouts.

### 5. Planting time

In higher hills (1800 meters above Mean Sea Level), plant potatoes during the first fortnight of April. In lower hills (800-1800 meters above MSL), plant 2-3 weeks earlier.

### 6. Manuring

(i) Apply well rotten farm yard manure (FYM) @ 15-30 t/ha in fur- rows at the time of planting. 30 t/ha FYM takes care of phosphorus and potassium needs of the potato crop. However, if FYM is applied at 15 t/ha, then apply half the dose of phosphorus and potassium through fertilizers. Apply FYM after the snowfall when field preparations are under- taken.

(ii) Apply in furrows 120-150 kg nitrogen (4.8 -6.0 q as calcium ammonium nitrate); about 100 kg phosphate (6.0 q as single super phosphate); and 100 kg potash (1.7 q muriate of potash) per hectare.

(iii) Apply nitrogen in split doses, 3/4 dose at planting time and the rest at earthingup. Cover the furrows.

### 7. Method of planting

Make furrows against the slopes at 60 cm distance between each of them. Plant the crop in 5 m<sup>2</sup> small beds and after every bed, provide drains to drainout excess rain water. This is important to reduce soil erosion. Apply FYM and fertilizers in furrows and plant the tubers in them at 20-25 cm distance depending upon the size of the seed using *khilna* (a hand tool used for cultivation in the hills). Cover the tubers immediately after planting by making small ridges of 10-15 cm height over the furrows.

## **8. Mulching**

Cover the ridges after planting with organic materials such as pine needles to conserve the moisture in the soil and to facilitate emergence of tubers.

## **9. Interculture**

Interculture operations, such, as weeding and earthing up are taken up according to the availability of soil moisture. These operations are delayed, if the soil moisture is inadequate after planting. If there is much weed growth, weeding may be done when potato plants are 10-15 cm high. Undertake final earthing up when the crop is about 6-8 weeks old. At this time, apply second 1/4th dose of nitrogen.

## **10. Plant protection**

(a) *Insect pests*: Potato is severely affected by white grubs in this region. During years of extended dry spells, cut worms and defoliators may also damage the crop. For controlling white grubs, integrated approach is recommended by applying carbofuran-3G or phorate-10G @ 2.5 kg lit/ha at earthing up. For cut worms, drench the ridges with chlorpyrifos 20 EC @ 2.5 lit/ha in 1000-1250 litres water after 75% germination has been obtained and 2% plants are damaged. For defoliators, spray the crop with endosulfan 35 EC @ 1.5 lit/ha or carbaryl 50% WP @ 2.5 kg/ha in 1000-1200 litres water. If pests incidence continues, give a second spray. Do not apply heptachlor and aldrin dusts as recommended by some agencies, because of longer persistency of their residues in tubers. Their use is now banned for this purpose.

(b) *Fungal diseases*: Several fungal diseases affect the potato crop in the hills. Late blight is the most important one. The others are *Cercospora* blotch, *Phoma* and early blight. To control these diseases, spray the crop with 0.2% mancozeb or bordeaux mixture (5:5:50) solution at about 10 days intervals with the onset of monsoon. Take care that lower surfaces of the foliage are also covered with the fungicidal solution. When spraying is done during the rainy season, add a sticker to the spray solution.

## **11. Harvesting and marketing**

The crop should be harvested as soon as it matures. If it is to be marketed earlier, the crop could be harvested in August-September. After harvest, air dry the tubers and keep in heaps for 10-15 days for skin curing. Sort out the damaged and rotted tubers. Grade the potatoes into different sizes and pack in gunny bags according to grades. Store the bags in a cool place till the produce is sent to the market to avoid greening of tubers. Green potatoes are bitter in taste, difficult to cook and can be toxic.

## **SEED POTATO PRODUCTION**

### **1. Recommended cultivar Kufri Jyoti.**

### **2. Seed source**

Obtain certified seed from an authorised agency.

### **3. Seed size**

Use seed tubers of 35-45 gm weight having multiple sprouts. Well sprouted tubers having multiple sprouts produce large numbers of seed size tubers. Do not use cut tubers as seed.

#### **4. Seed preparation**

Presprout the seed, collected from the previous harvest, by keeping in baskets or sprouting trays or spreading in a ventilated room, exposed to diffused natural light to ensure development of green healthy sprouts. This will promote the production of multiple sprouts. Carry the sprouted tubers to the field for planting only in seed trays or baskets to avoid sprout damage.

#### **5. Planting time**

In normal years, plant the crop in the second or third week of April. Early planting will cause cracking of tubers.

#### **6. Manuring**

- (i) Apply well rotten FYM @ 15-30 t/ha in furrows at the time of planting. 30 t/ha can take care of phosphorus and potassium needs of potato crop. However, if FYM is applied at 15 t/ha, then half the dose of phosphorus and potassium is to be applied through fertilizers. Apply FYM after the snow fall when field preparation is taken up.
- (ii) Apply 120-150 kg nitrogen (4.8 -6.0 q calcium 'ammonium nitrate); about 100 kg phosphorus (6.0 q single super phosphate) and 100 kg potash (1.7 q muriate of potash) per hectare in furrows. Nitrogen is best applied in two split doses. 2/3rd at planting time and 1/3rd at ear-thing up.

#### **7. Planting**

Make furrows against the slope at 60 cm distance. This is important to avoid soil erosion. Apply FYM and fertilizers in furrows and plant the tubers in furrows at 20-25 cm distance using a *khilna* (a hand tool used for cultivation in the hills). Cover the tubers by making small ridges of 10-15 cm height immediately after planting.

#### **8. Mulching**

Cover the ridges after planting with any plant material or farm wastes such as pine needles, straw, etc. to conserve soil moisture and thus ensure quicker germination.

#### **9. Interculture**

Earth up the beds after planting. Complete all the cultural operations such as weeding and earthing up within 40-50 days of planting, so that the plants are least disturbed at later stages of crop growth. Apply the second 1/3 dose of nitrogen at earthing up.

#### **10. Roguing**

Examine the plots twice or thrice and remove all ground keepers, off type, diseased plants showing mottling, mosaic, veinal necrosis, crinkling, rolling of the leaves, marginal flavesence and purple top roll. The first inspection may be done after the plants have attained 10-15 cm height and the second at flowering stage. During the later stages of the crop, if any plants show symptoms of purple top roll, they should be removed along with tubers.

## 11. Plant protection

(a) *Insect pests:* White grubs, cutworms and defoliators may damage the crop. Cut worms become serious during early stages of the crop, cularly in the years of prolonged dry spell. White grubs can be controlled by applying phorate 10G or carbofuran 3G @ 2.5 kg ai/ha at earthing up. For controlling cutworms, drench the ridges with chlorpyriphos 20EC @ 2.5 lit per ha in 1000-1250 litres water after 75% germination has been completed. For controlling defoliators, spray the crop with endosulfan 35 EC @ 1.5 lit/ha. or carbaryl 50% WP @ 2.5 kg/ha in 1000-1200 litres water. Occasionally a second spray may be required to be given in the field. Do not apply heptachlor and aldrin in potato crop because of longer persistency of their residues in potato tubers. Their use has been banned. To control aphids vectors of various virus diseases, appear" in the hills during middle of July, spray the crop with oxydemeton-methyl @ 1.2 lit/ha or dirnethoate 1.0 lit/ha in 1000-1200 litre water once or twice during July and August at about 10 days intervals when the number of aphids reach 20 per 100 compound leaves.

(b) *Fungal diseases:* In the hills, several fungal diseases damage the crop. Among them, late blight is the most important one. Others are *Cercospora* blotch, *Phoma*, early blight etc. To control them, spray the crop with 0.2% mancozeb or bordeaux mixture (5:5:50) solution at about 10 days interval with the onset of monsoon. Give one prophylectic spray of mancozeb 0.2% solution before the onset- of monsoon. While spraying, take care to see that the lower surfaces of the foliage are also covered with the spray solution. Add a sticker to the fungicide solution when spraying during the rainy season.

## 12. Haulm cutting

Cut the haulms in the 2nd-3r9 week of August as the crop starts maturing. This is done to prevent infestation by aphids. Bury cut haulms in pits, and do not leave them in the field. Ensure that there is no regrowth on the stumps after dehauling as tender and succulent leaves attract aphids.

## 13. Harvesting, grading and marketing

Harvest the crop after the rains have stopped when the skin of tubers has become firm. Surface-dry the produce and sort out all damaged, cracked and rotted tubers. Sort the tubers according to their sizes preferably into four grades-small, medium, large and extra large, depending upon their weight and/or diameter.

## 14. Seed treatment

After grading, wash the tubers in water. Dip the washed tubers in 1 % chlorocin solution and then rinse in water before treating with 3% solution of boric acid for 30 minutes to control surface borne diseases. The solution for this treatment can be used 20 times if the tubers have been thoroughly washed. After treatment, ensure proper drying of the tubers. Pack the seed tubers in gunny bags with proper labelling for marketing as seed.

## 15. Seed storage

Keep your home grown seed. Store the seed tubers in wooden trays of convenient size (say 75 cm x 45 cm x 15 cm) or baskets or spread on floor in a well ventilated room. Expose the seed tubers to diffused light. Take care that there is no risk of freezing during the entire period of storage and particularly in February-March for development of sturdy and multiple healthy green sprouts. Turn over the seed potatoes, spread on the floor once in

about a week to ensure uniform greening of tubers. Do not store seed potatoes in gunny bags to prevent development of etiolated and lanky sprouts.

*For further information, contact*

1. Director,  
Central Potato Research Institute,  
Shimla 171001, H.P. Phone: 3118, 2088  
Gram: POTATO SEARCH, SHIMLA -1 TELEX: 391 240 MOOL IN
2. Scientist-in-Charge,  
Central Potato Research Station Kufri 171 012, Shimla, H.P.  
Gram: POTATOSEARCH, KUFRI-SIUMLA-12.

Published by the Director, Central Potato Research Institute, Shimla 171 001, H.P. and printed at Tara Art Press, New Delhi 110002. 3000 Copies