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Popular Article

Scenario And Scope of Potato Cultivation in Telangana State

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Potato is the world's fourth important food crop after wheat, rice and maize owing to its great yield potential and high nutritive value and account for nearly half of the world annual output of all the tuber crops. Thus, with an annual global production of about 300 million tones, potato has become an economically important staple crop in both developed and developing countries.

Potato is a high calorie valued tuber crop. Potato is rich in carbohydrates (22-24%), protein (2.7%), fat (<0.5%) and water. Being a short duration crop, it produces more quantity of dry matter, edible energy and edible protein in shorter duration of time compared to cereals like rice and wheat. Hence, Potato is a very important crop to fight against food and nutritional security and poverty (Burgos, 2020).

National Scenario of Potato Cultivation

In India, potato is mainly grown in UP, Punjab, Haryana, West Bengal, Madhya Pradesh, Bihar, Telangana, Tamil Nadu, Gujarat and Karnataka. Potatoes are cultivated under highly diversified agro – climatic condition ranging from sea level to snowline. It requires 320C day temperature and less than 200 C night temperature for tuber development.

Potato is mainly grown as a Rabi season crop. Around 80% of potato production is obtained in Rabi crop only. Potato, as a Rabi crop is sown in the month of October-November and harvested in January-February, while the late sown crop of January is harvested in March. The share of Kharif potato in total production of potato in the country is 12%.



The following three types of crops are raised every year

- **Kharif crop:** July-August to October-November (Maharashtra, Himachal Pradesh, Jammu & Kashmir and Uttarakhand)
- **Rabi crop:** October-November to January-February (Uttar Pradesh, West Bengal, Bihar, Punjab, Telangana and Gujarat)
- **Summer crop:** March-April to July-August (Karnataka)

Although potato is a seasonal crop, it is grown in most of the states based on climatic conditions and harvested at different times, thus making it available throughout the year.

Potato Scenario in Telangana State

In Telangana, the area under potato cultivation has been increased from 4000 acres in 2004-05 to 5500 acres in 2020-21. The production has increased from 27,000 tonnes to 49,443 tonnes from 2004-05 to 2019-2020 respectively. Annual requirement of potato in Telangana State (4 crore population) is 2, 49,600 MTs. Deficit/ shortage of Potato in the state is 2.0 lakh tonnes per annum. The productivity per hectare also has been increased from 16.87 tonnes to 24.02 tonnes. The productivity of the local potato farms is much higher than national average productivity (Shiva Kumar and Vasudev, 2016).

The per capita consumption of potato in the state

- ✓ 17.33 g per day
- ✓ 0.52 kg per month
- ✓ 6.24 kg per year/person

In Telangana, 60% of the potato area and production is mainly grown in Sangareddy, Siddipet and Medak districts (combined Medak district) followed by Rangareddy and Vikarabad districts. Majority of the potato cultivation (70-80%) is under drip irrigation system being a progressive system of cultivation, but it is yet to be followed in many of the potato growing states.

It is observed that even though the area under potato in Telangana is much lesser than many potato growing states like U.P, West Bengal, Bihar, Punjab etc., the productivity is better than the other states and the prevalence of cool winter temperatures enables the area expansion of potato cultivation in Telangana. This clearly indicates that there is huge scope for increasing the scope on potato cultivation in Telangana and the farmers have been cultivating potato in the last 30-35 years and the acreage is increasing year by year.



Cultivation Practices Followed for Potato Crop in Telangana Varieties and Source:

Most of the potato farmers are growing variety C-166/ Kufri pukhraj sourced from Cold storages located in Agra, Uttar Pradesh. Few farmers also cultivate private varieties (Super Six) sourced from cold storages of Jalandhar, Punjab.

The following are the brief cultivation practices existing in this area.

- **Season:** October- November to January – February
- **Seed rate :** 1500-2000 kg/ha
- **Source of seed material:** Seed (small tubers of 30g) is procured from Agra (Sirsa). Hilly area seed was not preferred as the seed will be in dormancy, so only seed from Agra was preferred by farmers in spite of high transportation charges.
- **Seed treatment:** Seed tubers were treated with mancozeb @ 4-5 g/ litre of water for 10 minutes.
- For treating one quintal of seed tubers, 50 liters solution is required.
- **Spacing:** 50 cm X 20 cm
- **Planting System**

Particular	Broad Bed method	Ridge & Furrow method
No. of inline per bed	2	1
Bed width	140 cm	45-55 cm
Path width	40 cm	30-40 cm
Dist. Between rows	30 cm	30 cm
Dist. between plants	15-20 cm	15-20 cm
No. of crop rows per bed	4	2

Manures & fertilizers: Potato is a heavy feeder and responds well to the application of both mineral fertilizers and farmyard manure (FYM). Uptake of nutrients (NPK) by potato per unit area and time is high due to faster rate during early growth and tuber bulking.

Manuring is done in 3 spells.

1st spell (land preparation)-N- 40 kg, P- 60 kg, K-50 kg/ha

2nd spell (30 days after sowing)-N-40 kg, K-50 kg/ha

3rd spell (50 days after sowing)-N-40 kg, K-50 kg/ha

Cultural practices: Earthing up is necessary in potato for proper development of tubers and it depends upon aeration, moisture availability and proper soil temperature. If tubers exposed to direct



sunlight leading to formation of “Solanine” which is toxic substance. So, earthing prevents greening of tubers First earthing up is taken up 25-30 days after planting and second after 10 days of the first one.

Fertigation: Drip Irrigation system is to be adopted. Total water requirement for the crop varies from 350-550 mm. Irrigation has to be stopped at 10-15 days before harvesting to allow the tuber skin to become firm.

Harvesting: Harvest the crop when haulms start yellowing and falls on the ground. 10-15 Days before harvesting, the haulms should be cut when the irrigation is stopped. The harvesting operation should be completed before the



Drip Irrigation in Potato field

temperature rises above 30°C to avoid rotting due to high temperature. As the normal crop duration is 90-100 days, harvesting is done after 90 days after planting.

- **Physiological disorders:** a) Greening: Tubers exposed to sunlight becomes green due to formation of glycol-alkaloids and solanine which turns surface green. The tubers become bitter in taste and non-edible (toxic). Timely earthing up operations is recommended.
- **Plant Protection:** Cutworm, Potato aphids, Potato leaf hopper, Hadda beetle, Potato tuber moth and Root knot nematode are some of the important pests of potato in the state. While early and late blights are the two important diseases.
- **Yield:** 25 t/ha.
- **Approx. gross income** is Rs.3,00,000/- per ha. (@ Rs.12/- per kg)
- **Approx. cost of cultivation** is Rs. 1,87, 500/- per ha.
- **Approx. net return** is Rs 1,12,500/- per ha.

Expected Yield in Telangana with good management practices found to be ranged from 28.87 to 37.70 t/ha (Sruthi, 2021; Mahesh, 2021; Madhuri, 2022).

Constraints In Potato Cultivation in Telangana

The farmers have expressed the following constraints in potato cultivation

- **Non-availability of seed tubers:** The major issue faced by farmers is the procurement of Truthful Seed tubers from Central and Regional Potato Research Stations across India. The farmers are procuring the seed tubers every year through merchants from Agra. Erratic and early rains have also wreaked havoc and led to rotting of seed tubers in the early sowings of potato.



- **Low Price in the Market:** Inspire of achieving high yields, farmers are fetching low price in the market.
- **Lack of cold storage facility:** Staggered marketing is not possible due to lack of cold storage facility. The farmers are forced to sell the harvested potato at low prices and unable to command a good price due to glut in the market.
- The farmers who have harvested too early or too late to gain the best price are facing other issues such as small size and peeling due to early harvesting and tuber worms, reduction in weight *etc* due to late harvesting.
- **Information on Mechanization:** Total mechanization is required as the man power is limited and costly.
- **Marketing information:** Information on market requirements is not available.
- **Need for conduct of workshop & seminars:** Lack of workshops to create awareness among the farmers about the season, package of practices and to alert them about the probable pests and diseases.

Farmer Experiences

- Anathagiri FPO (Farmers producer Organization) of Mominpet, a Womens farmers Group based in Mominpet, Marpalli and Nawabpet Mandals of Vikarabad District have been motivated to take up potato cultivation on a large scale and procured good quality seed tuber from North India *i.e.*, Shimla specifically.



Field view of potato plantation on bed system with 2 row plantation and drip irrigation in Zaheerabad with var. K. Phukraj (C-166)



Interventions In Potato for Higher Yield in Telangana State

S.No	Practice	Existing Practice	Suggested Intervention	Increase/ decrease in cost	Impact on yield/income
1	Selection of Variety	Medium/Late maturing varieties	Early maturing varieties- Kufri Surya	Nil	Potatoes can be harvested by Dec- Jan when market price is high
		Moderately resistant varieties to Late blight	Resistant var (for late blight, nematode and viruses). like Kufri Karan	Nil	Loss of tubers by late blight can be decreased by 50%
		Cooking varieties	Processing varieties	Nil	10 t per ha, High yield, Buy back facility for processing varieties
		Potato grown only under sufficient irrigation	Drought tolerant varieties like Kufri Thar -1,2	20 % cost saved on irrigation	No effect on yield
2	Cropping pattern	Sole crop	Intercrop in Redgram (1:8) as sequence after soya bean/ any legumes	Benefit of useful soil bacteria from legumes	Efficient LER, Income from three crops
3	Method of planting	Ridge and Furrow	Raised bed	Bed maker cost or Additional Labour cost of Rs.10,000/- per ha manually	Better tuber penetration (Stolonization) and tuber development, More yield
4	Seed rate, Tuber size and spacing	3t/ ha Whole tuber each 70g with 60x30cm	*2t/ha, Tuber pieces of 30 g with 50x30cm (cut tubers are properly cured to dry for 24 hrs before planting to avoid rotting after sowing)	Seed rate reduced by 1ton (Rs.36,000/ton). reduction in transport cost. Rs. 5,000 additional labour cost for tuber cutting	More plants/ unit area, 10 percentage more marketable yield per hectare



5	Fertilizer application	Less manures and more chemicals	Integrated Nutrient management by using crop residues, green manures and more of P based K based fertilizer than N based.	No change	Good quality tuber Soil Health management.
6	Planting time	November 2 nd Fortnight	October 2 nd Fortnight	Nil	Early market for better prices
7	Earthing up	Practiced 2 times	3 times	Labour cost increased one extra earthing up	Better Marketable quality and better prices
8	Irrigation	Drip Irrigation	Drip Irrigation +Fertigation	Saves labour cost for top dressing (Rs.8000/ha)	Efficient utilization of fertilizers and 30% saving in the cost of fertilizers
9	Weeding	Hand/chemical	Mechanical by hoe (dual purpose) during first 2 months	Reduces labour cost by 50 %	Earthing up is also done by hoe simultaneously which reduces tuber greening and improves market quality
10	Prophylactic measures for late blight	Not practiced	Spraying of any copper fungicide from 1 month after planting @ weekly controls LB	Chemical cost Copper oxychloride additional cost (Rs.280) @1kg - 1120rs	Reduction of crop loss
11	Spraying of sprout inhibitors	Not practiced	Spraying CIPC 2.0g/Lit before harvest	Additional Chemical cost Rs.10,000 (Rs.1000/100g)	Prolonged dormancy. Better shelf life
12	Dehaulming	Not practiced	15 days before harvesting	Labour cost increased Rs.5000 per hectare	Better curing, Reduced damage while harvesting. Increase in marketable yield by 20 percent.
3	Harvesting	Manual	Potato digger	Cost on labour is reduced by 50%	Equipment cost. 1 lac-one time investment
14	Post harvest treatment	Not practiced	3% boric acid spray reduces surface borne diseases	Additional Chemical cost of Rs. 3600 (Rs.60/kg)	Market quality increases



SKLTSHU has initiated research on potato, to brief out few research highlights, Sruthi (2021) has reported that performance of potato varieties (6 No.) viz., Kufri Chipsona-1, Kufri chipsona-3, Kufri jyothi, Kufri chandramukhi, Kufri lauvkar, and Kufri pukhraj under Southern Telangana Agro climatic conditions revealed that Kufri Chipsona-3 recorded more number of tubers per plant (18.6), tuber yield (28.875 t/ha), highest starch content (27.36%) and highest B:C ratio (2.76) while Kufri pukhraj recorded maximum storage life under ambient conditions (71.45 days).

Another research conducted by Mahesh (2021) on the effect of nitrogen and potassium nutrition on growth, yield and quality and nutrient uptake in potato reported that application of N (145 kg/ha) and K₂O(180kg/ha) has significantly recorded maximum number of tubers (4.65), mean tuber weight (104.16 g), tuber yield (39.92t/ha), marketable yield (37.70 t/ha) and highest B:C ratio (3.20).

Raised bed with a spacing of 60 cm × 30 cm showed significant variation in tuber yield per plot (13.62 kg), tuber yield per hectare (34.05 t ha⁻¹) and marketable tuber yield per hectare (25.12 t ha⁻¹) at harvest (90 DAP) as reported by Madhuri, 2022.



Raised bed method of planting of potato

Conclusion

Among all the vegetables, consumption of potatoes consumed a lot across the country. There is constant demand for potatoes in the market and Telangana soil and climate is very much conducive for potato cultivation. Since potato cultivation is not taken up extensively in southern states, and are dependent on northern states for sufficient supply of potatoes. Hence it is the need of the hour to encourage Telangana farmers to take up potato cultivation which has demand all-round the year, aiming more crop per drop and helps partly in achieving nutritional security.



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