True Potato Seed: An Option for Availability of Good Seed

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ABSTRACT

Growing potatoes from true potato seeds is fun and you can discover some very good new varieties, but it is not as reliable as growing potatoes from tubers. Potato is a genetically diverse crop and the seedlings do not grow true. That means that every seedling grown from TPS is genetically unique and will produce tubers with different characteristics than the parent. Every potato plant grown from seed is a new variety. There are thousands of potato varieties with different colors and forms found in the Andes, but these types are a challenge to grow in North America because they do not form tubers until very late in the growing season. Andean potatoes are more readily available as TPS than as tubers.

INTRODUCTION

Potato is a widely used as vegetable in India but the country is still far behind in per capita consumption of potatoes than the developed countries. In India the average per capita annual availability for consumption is about 14 kg against 19 kg in Asia and 32 kg in the world. Potato is traditionally grown by vegetative true seed tuber. TPS minimize to overcome the problem of total cost of potato production. TPS concepts was first realized to raise commercial crop in India by Dr. S. Ramanujan (The first Director of CPRI).

What is TPS: TPS means the matured ovule developing in berry of the potato plant as a result of sexual reproduction/ fertilization. climate is not the only reason why potatoes don't make the list of most popular garden crops. Another factor is price. Potatoes are cheap. You probably can't grow potatoes more cheaply than you can buy them. Even if you can, it probably isn't as decisive a win as it can be to grow crops like tomatoes, peppers, asparagus, or berries, which tend to be more perishable and expensive. The third thing that we might factor in here is that there has not traditionally been much difference between the potatoes available to farmers and

gardeners. You can pick up any seed catalog and find dozens if not hundreds of different tomato varieties, most of which you will never find at the store. But the potatoes available to gardeners tend to be just the same varieties used in large scale growing. Most people probably don't see much point in growing the very same potatoes that they can buy so cheaply at the grocery store. It is this last factor that you can really change when growing potatoes from true seeds. Growing potatoes from TPS gives you access to greater genetic diversity. You can grow potatoes that have much different colors, shapes, and flavors than you will find at the grocery store. You can also grow potatoes that may be better suited to your particular climate than the commercial varieties that are overwhelmingly adapted for the northern states.

Advantages of TPS

- Free from pathogens
- Easy storage and transport
- Low cost
- Very low seed rate
- New potato producing areas
- Flexible planting time

Importance of TPS

100 grams of seed is sufficient to cover one hectare area instead of planting 2-2.5 tons of potato seed tuber. Being hybrid, it is capable of giving more production and is absolutely diseases free seed material. Cold storage facility is necessary for storing T.P.S. and is comparatively more resistance to the infestation of pests and diseases. As it required less seed per hectare so net profit is more.

Climate

Potato is basically a temperate crop and optimum temperature for potato growth and development ranges from 15 to 250C. Temperature below 210C favors tuberization. Long photo period favors haulm growth but delays maturity.

Soil

Potato is grown in all types of soils but light, well-drained sandy loam soils are best-suited. In India, maximum area under potato is in alluvial soils, followed by hill, black and red soils. Potato prefers soils in acidic neutral range (pH 5.5 - 6.0).

TPS production in plains

If the TPS parents are planted in the plains, there is generally need to provide extra light for about 5 hours at the end of the day to prolong the day length and get proper flowering. Hence, select such a field for planting as hybridization block, where in, arrangements can be made for providing light from 150 W Sodium Vapor Lamp (one for about every 100 sq.m.)

Varieties of TPS

- Alaska Red TPS/ C-3
- 92-PT-27 HPS-I/13
- JTH/C-107 Dutch Blue
- Kerr's Pink Kufri Jeevan

Sowing of TPS

1. Direct sowing in field

2. Sowing in nursery bed

(a). Transplant as seedling crop

(b). Seedling tubers production

Direct seeding

It requires 100-150 g TPS per ha (if 75% germination). Beds should be pre-irrigated. Sowing of seed by dibbling method, requires seeds to be sown in thin 0.5 cm deep furrows marked 45-50 cm apart. At two leaf stage seedlings may be sprayed with 0.1% urea at 3-4 days interval and earthing up and weeding

operations are done as per requirement. Problems (a) Poor Germination (b) Mortality of seedlings

Sowing in nursery bed

Prepare raised nursery beds with substrate i.e., soil and decomposed cow dung. Apply fertilizers @ 4-5g N; 6-8g P2O5 & 10g K2O per m2. Sown seeds by dibbling at 0.5 cm deep in furrows marked about 5 cm. About 125 g TPS and 75 sq. meter nursery bed area is needed to produce seedling for transplanting in one hectare and for seedling tuber production keep 80-100 seedlings per m2. At two leaf stage seedlings may be sprayed with 0.1% urea at 3 - 4 days interval. Weeding and earthing are done as per requirement up as required.

Seedling transplant crop

Make small ridges and furrows spaced 45-50 cm apart and 2-3 days before transplanting irrigate the field up to 1/3 of the ridge. Transplant seedlings at 4-5 leaf stage at the water mark on the north facing side of the ridge. Earthing up operations are done at 25-30 days & 50-60 days after transplanting. Apply recommended basal fertilizer dose with ½ N in 2 equal split top dressing. Dehaulming is done at maturity and harvest after 10-15 days of dehaulming.

Practices of production of Seed tubers using TPS

At present there are two methods in practice for producing seedling tubers in bed:

(a) Single row method.

(b) Double row method.

Single row method

Prepare beds of 6 inches or 15 cm height, 1 m width and according to convenient length at 75 cm apart. Soil should be bringing to fine tilth by incorporating well-rotten FYM. Apply Urea, S.S.P and S.O.P. @ 20, 6 & 25 g/sq. m as basal dose and sow 2-3 seeds per hole at 0.5 cm depth with 20 X 5 cm spacing. Provide shade to avoid sun scorching and irrigate the beds with fine rose cane as per necessity. Earth up with the mixture of finely prepared soil and FYM along with Urea @ 5 g/sq. m at 30, 45 and 60 DAS & cut the haulms at 85 day. Treat the Tuber with 3% Boric-acid and store in cold storage for next year after proper drying in shade.

Double row method

Preparation of field and other operation are same as single row method except sowing of seeds. In this method seeds are sown 4 cm apart in a line and row to row distance is 10 cm. In between two double row distance is 30 cm. Top dressing with 5 gm of Urea per q. m at 30th , 45th and 60th day followed by earthing up as practiced in normal crop so that two lines can be covered by a single furrow.

Manures and fertilizers

Potato being a shallow-rooted crop, requires high nutrients. It needs 100-120 kg N, 50-60 kg P205 and 100-120 kg K2O /ha. The response to NPK depends not only upon the fertility status of soils but also on variety, cropping system and source of nutrients.

Intercultural Operations

This is done to bring the soil loose and destroy the weeds. The first earthing-up should be done when plants are 15-25 cm height. The second earthing-up is often required later to cover up the tubers properly.

Weed control

Herbicides like Metribuzin (Sensor) @ (1.0 kg a.i./ha) applied as pre-emergence spray are effective. Lasso (Alachlor) @ 2 liters /ha can also be used.

Seed extraction

Berries are harvested after about 8 weeks of pollination and allowed to ripen at room temperature till these become soft enough for seed extraction by maceration. Shade dried seeds are exposed to sun for one hour and

further dried on silica gel till moisture is < 5 % and dried seed are sealed in aluminium foil packets.

Yield

From a well cultivated potato field we can obtain 35-40 tonnes / ha yield. TPS yields about 90 - 100kg /ha.

CONCLUSION

Cost of cultivation can be minimized (40%) by using true potato seed. TPS have 100% genetic purity and it also prevent the incidence of insect, pest & diseases to a much greater extent. TPS is better than tubers because of inexpensive storage & transport.

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