

PUNJAB VIDHAN SABHA
BILL NO. 27-PLA-2020
THE PUNJAB TISSUE CULTURE BASED SEED POTATO
BILL, 2020

A

BILL

to provide for regulating the quality of potato seeds produced through tissue culture plants in aeroponics or nethouse and for matters connected therewith or incidental thereto.

BE it enacted by the Legislature of the State of Punjab in the Seventy-first Year of the Republic of India, as follows:-

1. (1) This Act may be called the Punjab Tissue Culture Based Seed Potato Act, 2020. Short title, extent and commencement.
 - (2) It shall extend to the whole of the State of Punjab.
 - (3) It shall come into force on and with effect from the date of its publication in the Official Gazette.
2. In this Act, unless the context otherwise requires,- Definitions.
 - (a) "Agriculture" includes horticulture;
 - (b) "Appellate Authority" means Director, Department of Horticulture, Punjab;
 - (c) "certification agency" means the Punjab State Seed Certification Authority or any other such agency as may be notified by the State Government;
 - (d) "Committee" means the Tissue Culture Based Seed Potato Committee constituted under section 3 of this Act;
 - (e) "Licensing Authority" means the Department of Horticulture, Punjab which shall issue the license for seed potato production through tissue culture based aeroponics or nethouse facility in the State of Punjab;
 - (f) "notified variety", in relation to seed potato, means a variety thereof notified under section 5 of the Seeds Act, 1966;
 - (g) "prescribed" means prescribed by rules made under this Act;
 - (h) "Schedule" means the Schedule appended to this Act;
 - (i) "seed potato" means potato minitubers or tubers raised through

tissue culture based aeroponics or nethouse technology and its successive field generations used for sowing or planting:

- (j) "seed potato grower" means the Farmer Producer Organisation (FPOs) or Society or group of farmers or seed producing company or individual grower;
- (k) 'State Government' means the Government of the State of Punjab in the Department of Agriculture and Farmers Welfare;
- (l) "State Seed Laboratory" means the State Seed Laboratory established under sub-section (2) of section 4 of the Seeds Act, 1966 or any other laboratory notified as such by the State Government; and
- (m) "variety" means a sub-division or grouping of plants within the cultivated potato identifiable by growth, yield, plant, fruit, seed or other characteristics.

Tissue Culture Based Seed Potato Committee.

3. (1) The State Government shall, as soon as may be after the commencement of this Act, constitute a Committee to be called the Tissue Culture Based Seed Potato Committee to advise the State Government on matters arising out of the administration of this Act and matters related thereto and to carry out such other functions as may be assigned to it by the Government.

(2) The Committee constituted under sub-section (1) may appoint one or more Sub-Committees consisting wholly of members of the Committee or wholly of other persons or partly of members of the Committee and partly of other persons, as it thinks fit, for the purpose of discharging such of its functions as may be delegated to such Sub-Committee or Sub-Committees by the Committee.

Minimum seed certification standards.

4. The specified minimum seed certification standards shall be as per the Schedule appended to this Act.

Certification agency.

5. The Punjab State Seed Certification Authority established under Section 8 of the Seeds Act, 1966 or any other agency, as may be notified by the State Government shall be the certification agency for certification and traceability for such other purposes.

Grant of certificate by certification agency.

6. (1) Any seed potato grower involved in the production, multiplication of tissue culture based seed potato, if he desires to have such seed certified by the certification agency, may apply to the certification agency for the grant

of a certificate for the purpose.

(2) Every application under sub-section (1) shall be made in such form, and shall contain such particulars and shall be accompanied by such fees, as may be prescribed.

(3) On receipt of any such application for the grant of a certificate, the certification agency may, after such enquiry as it thinks fit and after satisfying itself that the seed to which the application relates conforms to the minimum seed certification standards specified for that seed under section 4 of this Act, grant a certificate in such form and subject to such conditions, as may be prescribed.

(4) The certification agency shall ensure full traceability of each certified class of seed and that the material being initiated for producing mini-tubers is of notified variety and confirmed identity, including all documentation with respect to its origin.

7. If the certification agency is satisfied, either on a reference made to it in this behalf or otherwise, that,- Revocation of certificate.

- (a) the certificate granted by it under section 6 has been obtained by misrepresentation as to an essential fact; or
- (b) the holder of the certificate has, without reasonable cause, failed to comply with the conditions subject to which the certificate has been granted or has contravened any of the provisions of this Act or the rules made there under, then, without prejudice to any other penalty to which the holder of the certificate may be liable under this Act, the certification agency may, after giving the holder of the certificate an opportunity of showing cause, revoke the certificate.

8. (1) Any person aggrieved by a decision of a certification agency under section 6 or section 7, may, within thirty days from the date on which the decision is communicated to him and on payment of such fees, as may be prescribed, prefer an appeal to Appellate Authority: Appeal.

Provided that the Appellate Authority may entertain an appeal after the expiry of the said period of thirty days, if it is satisfied that the appellant was prevented by a sufficient cause from presenting the appeal within the said period of thirty days.

(2) On receipt of an appeal under sub-section (1), the Appellate Authority shall, after giving the appellant an opportunity of being heard, pass such order as it thinks fit.

(3) Every order of the Appellate Authority under this section, shall be final.

Review of order.

9. The Additional Chief Secretary (Development) may, *suo moto* or on the application of the person to a reference, call for and examine the record of any proceedings in which no appeal under section 8 of this Act lies before the Appellate Authority, as the case may be, for the purpose of satisfying himself as to the legality or propriety of any decision or order passed and if in any case appears to the Additional Chief Secretary (Development) that any such decision or order should be modified, annulled or revised, the Additional Chief Secretary (Development), as the case may be, may, after giving persons affected thereby an opportunity of being heard, pass such order thereon, as he may deem fit.

Penalty.

10. (1) If any seed potato grower contravenes any of the provisions of this Act or any rule made there under, he shall be liable,-

- (a) to pay for the first offence with fine which may extend to fifty thousand rupees, and
- (b) in the event of such person having been previously convicted of an offence under this section, to undergo imprisonment for a term which may extend to six months, or with fine which may extend to one lakh rupees, or with both.

(2) The Sub-Committee constituted under sub-section (2) of section 3 of this Act shall recommend the licensing authority to cancel the license and blacklist the person restricting him for dealing with any kind of seed production for a minimum period of three years.

Forfeiture of seed.

11. When any person has been convicted under this Act for the contravention of any of the provisions of this Act or the rules made there under, the seed in respect of which the contravention has been committed shall be forfeited and destroyed.

Protection of action taken in good faith.

12. No suit, prosecution or other legal proceedings shall lie against the Government or any officer of the State Government for anything which is done in good faith or intended to be done in good faith under this Act or the rules made thereunder.

13. (1) The State Government may, by notification in the Official Gazette make rules for carrying out the purposes of this Act. Power to make rules.

(2) In particular and without prejudice to the generality of the fore-going power, such rules may provide, for all or any of the following matters, namely:-

- (a) the functions of the committee referred in section 3 of this Act:
and
- (b) any other matter, which is to be or may be prescribed, under this Act.

(3) Every rule made under this section, shall be laid, as soon as may be, after it is made, before the house of the State Legislature while it is in session for a total period of ten days, which may be comprised in one session or in two or more successive sessions and if, before the expiry of the session in which, it is so laid or the successive sessions as aforesaid, the house agrees in making any modification in the rules or the house agrees that the rules should not be made, the rules shall thereafter have effect only in such modified form or be of no effect, as the case may be, so however, that any such modification or annulment shall be without prejudice to the validity of anything previously done or omitted to be done under that rule.

14. If any difficulty arises in giving effect to the provisions of this Act, the State Government may, by order, published in the Official Gazette, make such provision not inconsistent with the provisions of this Act, as appears to the Government to be necessary or expedient for the purpose of removing the difficulty: Power to remove difficulties.

Provided that no such order shall be made under this section, after the expiry of a period of three years from the date of commencement of this Act.

SCHEDULE

(see section 4)

**DRAFT OF MINIMUM SEED CERTIFICATION STANDARDS
FOR TISSUE CULTURE BASED SEED POTATO**

I. Application and Amplification of General Seed Standards for tissue culture based potato seed

- (a) The general seed standards are applicable to tissue culture raised mini-tubers (G-0) multiplied through aeroponics or nethouse conditions and further multiplied in the field for four generations (G1-G4) as shown below:

Stages of 'Tissue Culture Based Potato Production System'

Mother Plant	
Multiplication through Tissue Culture (8-12) Cuttings/Subculture	
G0 Aeroponics	G0 Net House
G1 Open Field	G1 Open Field
G2 Open Field	G2 Open Field
G3 Open Field	G3 Open Field
G4 Open Field	G4 Open Field

I. Eligibility requirements for tissue culture based mini-tubers (G-0)

The mini-tubers to be eligible for certification shall be from a source meeting the following standards aeroponics or nethouse facilities.

- (i) Laboratory and aeroponics or nethouse facilities used for production of plantlets/micro-tubers or mini-tubers shall be maintained free of potato pests or vectors of potato pathogens. Failure to keep such pests under control may cause rejection of all lots maintained in the facility. All potting or growth media shall be sterile. Water to be used in a laboratory or aeroponics or nethouse operation should be free from impurities.
- (ii) Hygienic conditions like maintenance of air purity, sub culturing under laminar flow only, use of pure tissue grade chemicals for media preparation, proper autoclaving of cultured media, proper disposal of contamination etc. shall be strictly observed during micro propagation.

potting, planting, irrigating, movement and use of equipment and other laboratory practices to guard against the spread of diseases or pests in the facilities used for seed multiplication.

- (iii) All micro propagation and aeroponics or nethouse facilities must be approved by authorised State or Central Govt agency, as per the standard/ guidelines. These facilities must have a changing area between the double doors.
- (iv) The aeroponics facility used for mini-tuber production from micro-plants shall be approved by Central Potato research Institute, Shimla
- (v) The net house must be "insect proof" and be equipped with a double-door entrance, provision for footwear disinfection prior to entering the net house and insect proof ventilation screening on intakes and exhaust openings. The persons entering the aeroponics or nethouse facility should use Wellington boots (Plastic boots) and change lab-coat in the changing area to reduce the chances of inadvertent introduction of vector insects clinging to clothes.
- (vi) The material being initiated for producing mini-tubers must be of Notified variety and confirmed identity. It must be duly documented with respect to origin.
- (vii) The plants of a potato varieties being initiated for tissue culture should be tested in an accredited laboratory for freedom from the following PVA (Potato Virus A), PVS (Potato Virus S), PVM (Potato Virus M), PVY (Potato Virus Y), PVX (Potato Virus X), PLRV (Potato Leaf Roll Virus), PALCV (Potato Apical Leaf Curl Virus), GBNV (Groundnut Bud Necrosis Virus), PSTVd (Potato Spindle Tuber Viroid) entophytic and Phytoplasma or epiphytic bacteria and fungi. Tests must be carried on a minimum of ten plantlets of each variety selected at random. For virus testing ELISA or an equivalent method should be used, for viroid RT-PCR should be used, and for fungi and bacteria light microscopy and culturing on media should be used.

2. Sources of seed

- (i) The tissue culture facility should use recognized aseptic initiation and propagation procedures (i.e. follow procedures and use equipment, which will maintain sterile conditions as per standard tissue culture norms).

- (ii) The initiating facility must maintain following information on each variety for review and audit by the competent authority once in a year: variety identification, date of initiation, origin and testing results from accredited laboratory.
- (iii) Tests must be carried out on a minimum of ten plantlets (lot size as per SOP of Department of Biotechnology, GOI) selected at random, for each variety by an accredited laboratory. No plant should contain PVA, PVS, PVM, PVY, PVX, PLRV, PALCV, GBNV, phytoplasma, PSTVd and other endophytic or epiphytic bacteria and fungi.
- (iv) Valid pathogen testing results are required prior to the initiation of micro tuber production cycle or planting of test tube plantlets in the aeroponics or nethouse facility.
- (v) Mini-tubers/micro-tubers shall be produced and multiplied from approved source in vitro plants as per the requirements.
- (vi) Aeroponics or nethouse produced mini-tubers must be certified as G0 by the Punjab State Seed Certification Authority.
- (vii) G0 shall be used for further production of G1 to G4 certified classes of seed as prescribed in proposed seed standards. The certificates shall be issued by the Punjab State Seed Certification Authority.

II. Aeroponics or nethouse Environment Requirements

- (a) All micro propagation and aeroponics or nethouse facilities must meet the standards given above under eligibility requirements.
- (b) The soil used for mini-tuber production should not be infested with pathogen and pests of potato, particularly the following:
 - wart (*Synchytrium endobioticum* (Schilb.) Perc.) and or cyst forming nematodes;
 - brown rot (*Ralstonia solanacearum* (E.F. Sm.) E.F. Sm.) or non-cyst forming nematodes within the previous three years;
 - common scab (*Streptomyces scabies* (Thaxt.) Waks. & Henrici).
 - Black scurf (*Rhizoctonia Solani Kuehn*).
- (c) The nutrient medium used for aeroponics shall be prepared in clean water free from all potato pathogens.

III. Inspection of Aeroponics or nethouse facility used for production of mini-tubers (G-0).

- a. The seed potato grower must notify the competent authority of his production plans 30 days prior to the recommended planting date.
- b. The crop must be grown from approved basic source *in vitro* plants which were produced, in an aseptic environment.
- c. The tissue plantlets in the aeroponics or nethouse facility will be planted at 15x15cm and 30x15 cm, respectively.
- d. A minimum of three inspections shall be made as follows:
 - i. The first inspection shall be made at 30-35 days to verify growing conditions, extent of disease infection and off types;
 - ii. The second inspections shall be made at 60-65 days after planting to verify off types, disease infection if any and pathogen testing, on a representative sample, comprising of 1% of the plants with a minimum of 5 and a maximum of 25 plants sampled for each variety;
 - iii. The third inspection shall be made immediately after haulms cutting/ destruction in the net house crop in order to verify that haulms have been cut/destroyed by the prescribed date and proper manner.
 - iv. In case the crop is grown under aeroponics, third inspection can be after the crop has been finally terminated.
 - v. Effective sanitation practices including insect and disease monitoring and prevention must be adhered to.
 - vi. The aeroponics or nethouse must be free from all potato and solanaceous plant debris before planting.
 - vii. No field-produced seed potatoes (including pathogen tested clonal selections), non-seed potatoes, nor any other solanaceous species of plants can be grown in the net house while used to produce minitubers.
 - viii. Varieties must be separated by appropriate partitioning of net house to prevent varietal mixture.
 - ix. If testing performed by an accredited laboratory reveals the presence of banned virus (es), fungus or bacteria, all the crops in the net house will be ineligible for multiplication and the entire material will be destroyed.

- x. In the eventuality of detection of insect (particularly aphids, thrips and white flies) vectors (for which yellow sticky traps should be put at least at three places in the net house) by competent Authority, the grower must provide post harvest test results to this authority. A representative sample, representing each variety grown in the net house must be post harvest tested and if the results are negative for PVA, PVS, PVM, PVY, PVX, PLRV, GBNV, phytoplasma, and PALCV, the crop will be assigned G0 status or otherwise rejected.

IV. Land Requirements

A crop of seed potato (G1-G4) shall not be eligible for certification if grown on land infested with:

- (a) Wart (*Synchytrium endobioticum* (Schilb.) Perc. And or cyst forming nematodes;
- (b) Brown rot (*Ralstonia solanacearum* (E.F. Sm.) E.F. Sm.) Or non-cyst forming nematodes within the previous three years;
- (c) Common scab (*Streptomyces scabies* (Thaxt.) Waks. & Henrici).
- (d) Crop rotation schedule as per seed plot technique.

V. Field Inspection

A minimum of four inspections shall be made as follows:

- (a) the first inspection shall be made about 30-35 days after planting the mini-tubers to verify isolation, off types and the extent of disease infection with specific reference to mild and severe mosaics, leaf roll, PALCV, GBNV, phytoplasma, brown rot late blight and other relevant factors;
- (b) the second inspection shall be made about 60-65 days after planting the mini-tubers to check isolation, off types and extent of disease infection with specific reference to mild and severe mosaics, leaf roll, yellow, brown rot and other relevant factors;
- (c) the third inspection shall be made immediately after haulms cutting/ destruction in order to verify that haulms have been cut/destroyed by the prescribed date and in proper manner;
- (d) the fourth inspection shall be made about 10 days after haulms cutting/destruction and before harvesting in order to verify that no re-growth of haulms has taken place.

VI. Seed Standards

A. Standards for mini-tuber (G-0) production in the aeroponics/nethouse facility

(1) General requirements

- (i) **Isolation:** Minimum 1 meter between the different varieties grown in net house, so as to avoid mechanical admixture. In aeroponics facility separate grow boxes shall be used for each variety and two varieties cannot be grown in the same grow box.
- (ii) All micro propagation and aeroponics or nethouse facilities must be approved by competent authority set up by the state Govt., as per the standards given above under eligibility requirements.

(2) Specific requirements

Maximum permissible limits

Factor	Maximum permissible limit
*Off type	0.001%
*Plants showing symptoms of mild mosaic	0.001%
*Plants showing symptoms of severe mosaic, leaf roll, PACLV, GBNV, phytoplasma and apical leaf curl	Nil
**Plants infected with brown rot (<i>Ralstonia solanacearum</i>)	Nil

* At the time of crop termination

**Maximum permitted at final inspection in the net house raised crop

(3) Seed Standards for mini-tuber

Factor	Permissible limit
Weight of minituber (minimum)	1.0 g (minimum)
Germination (minimum)	90% (minimum)
Varietal purity (percent plants)	99% (minimum)
Virus infestation (percent plants)	0.001% (maximum)

B. Field standards for G1 to G4 Crop raised out of Potato Tissue Culture based mini-tuber.

(1) General requirements

Isolation: The fields of seed potato shall be isolated from the contaminants shown in column 1 of the Table below by the distances specified in columns 2-6 of the said Table

Containments	Minimum distance (meters)			
	G1	G2	G3	G4
Fields of other varieties	5	5	5	5
Fields of same variety not conforming to requirement for certification	5	5	5	5

(2) Specific requirements

Factor	Maximum Permissible limits			
	G1	G2	G3	G4
Off types (%)(1st and 2nd inspection)	0%	0%	0.05%	0.05%
Plants showing symptoms of mild mosaic (1st and 2nd inspection)	0%	0%	1.0%	2.0%
Plants showing symptoms of severe mosaic, leaf roll, PACLV, GBV, phytoplasma (1st and 2nd inspection)	0%	0%	0.5%	0.75%
*Total virus	0%	0%	1.0%	2.0%
Plants infected by brown rot (syn Bacterial wilt) <i>Ralstonia solanacearum</i> (1st and 2nd inspection)	None	None	None	None
**Regrowth of plants after destruction of haulms (4th inspection)	0%	0%	0.5%	0.5%

*Of the two inspections, the higher virus percentage will be considered for the purpose of the specified limits of tolerance.

**Standards for re-growth after destruction of haulms shall be met at fourth inspection to be conducted about 10 days after haulms cutting.

Note:

- (i) All off types and diseased plants should be rouged out along with the tubers and destroyed.

- (ii) Gaps in the seed plot should not be more than 10.0%.
- (iii) Haulms must be destroyed as close to the ground as possible before the date specified by the Certification Agency. Failure to destroy haulms in time shall render the crop liable for rejection.

C. Seed Standards (G1 to G4)

(1) Size and weight Specification

Size	Mean length and two widths at the middle of tuber	Corresponding weight
Seed Size	30-55 mm	25-125 g
Large size	Above 55 mm	Above 125 g

Note:

- (i) The size of tuber will be decided either on the basis of mean of two widths of a tuber at the middle and that of length or on the basis of corresponding weight of tuber.
- (ii) In a seed lot, tubers not conforming to specific size of seed shall not exceed more than 5.0% (by number).
- (iii) The seed material shall be reasonably clean, healthy, firm and shall conform to the characteristics of the variety. The tubers not conforming to the varietal characteristics shall not exceed 0.050% for G1 and G2 class of seed and 0.10% (by number) for G3, G4 and G4 class of seed.
- (iv) Cut, bruised, unshapy, cracked tubers or those damaged by insects, slugs or worms shall not exceed more than 1.0% (by weight).
- (v) Greenish pigmentation on tubers will not be a disqualification for certification.

(2) Maximum tolerance limit of tubers showing visible symptoms caused by the diseases mentioned below will be as follows:

Disease	Maximum Permissible limits (By number)			
	G1	G2	G3	G4
Late blight (<i>Phytophthora</i>)	0.1%	0.1%	0.5%	1.0%

infestations (Mont.) de Bary).
dry rot (*Fusarium caeruleum*
(Lib.) Sacc.) or Charcoal rot
(*Macrophomina phaseoli* (Tassi)
G. Goidanich).

Wet rot (<i>Scierotium rolfsii</i> Sacc.)	None	None	None	None
*Common scab (<i>Streptomyces</i> scabies (Thaxt) Waks. & Henrici)	1.0%	1.0%	2.0%	3.0%
Brown rot (<i>Ralstonia</i> <i>solanacearum</i> (E.F. Sm.) E.F. Sm.)	0.0	0.0	0.0	0.0
**Black scurf (<i>Rhizoctonia</i> <i>solani</i> Kuehn.)	2.0%	3.0%	5.0%	5.0%
Total diseases	3.1%	4.1%	7.5%	9.0%

*Even if a single tuber infected with common scab is detected in a seed lot, the entire seed lot shall be treated with approved chemical before seed lot is declared fit for certification. Seed lots having infected tubers more than the prescribed limits will not be certified even after treatment.

** (i) A tuber carrying 5% or above scuffed surface will be considered as one infected unit.

(ii) Seed lots having black scurf infection more than the prescribed limits (5-10%) could be certified after treatment with approved chemical/fungicide.

(iii) For all diseases, the higher disease percentage will be considered for the purpose of the specified limits of tolerance.

3. Traceability

- (i) Producer of any class of seed must keep written record of the source of seed used for producing next class of seed.
- (ii) At the time of certification, information like name, address, phone number and email of the producing agency shall be clearly mentioned on the seed label.

- (iii) Only certified seed of one class can be used to produce certified seed of next class. This rule shall apply from G0 to G4 to ensure full traceability.
- (iv) The label must have a QR code containing all the information printed on the label.

4. Labelling of Seed G0 to G4

Seed tubers shall be supplied in sealed containers. A cloth-lined label of 12 cm x 6 cm containing following information shall be affixed on the container.

Label Number Crop Potato

Variety Class of Seed

Lot No.

Germination/sprouting (Minimum)

Producing agency (Name, address, phone #, email)

Approving authority Signature and stamp

QR Code



Tag colour: G0 (Grey), G1 (Pink), G2 (Brown), G3 (Orange), G4 (Red)

STATEMENT OF OBJECTS AND REASONS

In order to fulfil the demand and availability of virus/ disease free certified seed, providing impetus to crop diversification and benefit to potato farmers, a seed potato certification system has been devised integrating the seed potato produced through tissue culture technology using Aeroponics/ net house facilities. Due to favourable environment conditions, State will be developed as a hub for production of quality seed potato.

'The Punjab Tissue Culture Based Seed Potato Bill, 2020' is aimed to achieve this objective by providing for a certification system for mini tubers raised through tissue culture technology using Aeroponics/ net house facilities and its successive generations.

AMARINDER SINGH,
Chief Minister, Punjab.

MEMORANDUM REGARDING DELEGATED LEGISLATION

Section 13 of the Punjab Tissue Culture Based Seed Potato Bill, 2020 empowers the State Government to make rules to carry out the purposes of this Act. The powers sought are necessary for the proper implementation of the provisions of the Act and are normal in nature.

CHANDIGARH
THE 18th OCTOBER, 2020

SHASHI LAKHANPAL MISHRA
SECRETARY.

N.B. - The above Bill was published in the Punjab Government Gazette (Extraordinary), dated the 18th October, 2020 under the proviso to rule 121 of the Rules of Procedure and Conduct of Business in the Punjab Vidhan Sabha (Punjab Legislative Assembly).