STANDARDIZATION IN REQUIREMENTS FOR GOOD AGRICULTURAL PRACTICES — IndiaGAP

Quick Check

Which subject is not covered under GAP?

A. Irrigation/Fertigation
B. Product Recall Procedure
C. Plant Nutrient Management/Fertilizer Use
D. Loading and Transport
E. None of the above?

1. **What is full form of GAP?**
2. **For which crop GAP is needed?**
3. **What is IndiaGAP?**
4. **What is GlobalGAP?**
5. **Do GAP covers Integrated Pest management (IPM) ?**
6. **Do GAP ensures traceability?**
7. **Should post harvest activities be covered under GAP?**

Which one of the compliance criteria is major under IndiaGAP ?

A. Training of Workers
B. Quality of Seeds
C. Method of Organic Manure Preparation
D. Method of Irrigation/ Fertigation
E. None of the above?

What the standard is for?

The standards would reap following broad benefits:

a) Development of basic infrastructure at the field level;
b) Build up culture for good agricultural practices by the farmers;
c) Uniform approach across farms regardless of their sizes;
d) Increased awareness among the farmers as well as the consumers about the need for consumption of good quality and safe food;
e) Traceability through complete integration of food chain;
f) Improvement in the environment as well as soil fertility;
g) Worker safety and welfare;
h) Reputation in the international market as a producer of good quality and safe produce; and
i) Over coming the Technical Barriers to Trade (TBTs).

All about the Standard

- ✓ To standardize crop based agricultural practices in India keeping in mind the best of international practices and suiting the needs of the Indian farmer.
- ✓ Aligned with GlobalGAP but the compliance criteria are based on Indian practices.
- ✓ Takes into account not only the quality and safety of the crop obtained from an unit area but also the care and attention gone into integrating pre-harvest practices like soil and water management, nutrient management and pest management, harvesting, post-harvest handling, packaging, storage and other logistics.
- ✓ The objective is to ensure food safety, occupational health/safety/welfare, and wherever possible animal welfare. The entire operation is also intended to make farming practices environment friendly.

The list of Indian Standards on GAP

IS 15930 (Part 1) : 2011
Requirements for good agricultural practices - IndiaGap: Part 1 crop base

IS 15930 (Part 3) : 2019
Requirements for good agricultural practices - IndiaGap: Part 3 Combinable Crop Base

IS 15930 (Part 4) : 2019
Requirements for good agricultural practices - IndiaGap: Part 4 tea base

IS 15930 (Part 5) : 2017
Requirements for good agricultural practices - IndiaGap: Part 5 coffee base

IS 15930 (Part 7) : 2018
Requirements for good agricultural practices - IndiaGap: Part 7 poultry base

IS 15930 (Part 8) : 2017
Requirements for good agricultural practices - IndiaGap: Part 8 cattle and sheep base

IS 15930 (Part 1) : 2011

Requirements for good agricultural practices - IndiaGap: Part 1 crop base

- ✓ This standard (Part 1) covers the control points and compliance criteria necessary to be followed by the producers (individual growers and/or members of a grower group) of crops.
- ✓ This standard covers the following products in fresh form for direct human consumption or for further processing or for feed for animals producing food for human consumption:

a) Fruits and vegetables;
b) Food grains;
c) Plantation crops;
d) Spices and condiments; and

CONTROL POINTS AND COMPLIANCE CRITERIA

- ✓ Control points and compliance criteria required to be followed by the applicant producer as well as by the certification body for independent verification of the agricultural practices that have gone into the production of the produce.
- ✓ 'Major' have a definite effect on the safety and quality of the produce and shall, therefore, be complied with, or shall give Adequate assurance about the safety and quality of the produce.
- ✓ 'Minor', though have a bearing on quality, are those which, if implemented, would provide an advantage to the assessment for IndiaGAP certification.
- ✓ 'Reco', are those, which though may not have direct bearing on Safety and quality of produce but may have other benefits to the producer and are recommended for implementation and are advisory in nature.

Category of Licence	Compliance of Major Requirements in Percent	Compliance of Minor Requirements in Percent
IndiaGAP-A	100	90
IndiaGAP-B	100	80
IndiaGAP-C	100	**75**

- ➢ Site Record and Traceability
- ➢ Land and Soil Management
- ➢ Grower Record
- ➢ Seeds and Planting Materials
- ➢ Nursery
- ➢ Genetically Modified Organisms (GMO)
- ➢ Cultural Practices
- ➢ Sowing/Planting/Transplanting
- ➢ Plant Nutrient Management/Fertilizer Use
- ➢ Irrigation/Fertigation
- ➢ Drainage System
- ➢ Crop Protection
- ➢ Crop Maturity
- ➢ Harvesting
- ➢ Post-harvest Handling
- ➢ Packaging
- ➢ Loading and Transport
- ➢ Environmental Issues
- ➢ Complaint Procedure
- ➢ Product Recall Procedure

Site record and Traceability

Traceability facilitates the withdrawal of foods and enables customers to be provided with targeted and accurate information concerning implicated products.

Identification and Traceability	Major	IndiaGAP registered produce shall be traceable back to and trackable from the registered farm (and other relevant registered areas) where it has been grown.
Farm location	Minor	Survey No./Part-Survey No., village, tehsil district, state where the farm is located along with total area under cultivation and the area under IndiaGAP certification shall be specified.
Farm Layout	Minor	Fields/plots and structures shall be identified on the layout map of the farm.
Vicinity of Production Area to Potential Risk Source	Major	Location of the field with special reference to vicinity to brick kilns, chemical or other industries, rivers, canals, other water sources, hill rocks, forests, pastures and reclaimed land shall be specified and measures shall be in place to check contamination.

Land and Soil Management

Soil is the basis of all agricultural production, and the conversation and improvement of this valuable resource is essential. Good soil husbandry ensures long-term fertility of soil, aids yield and profitability.

Land Capability Classification and Soil Mapping	Reco	The land should be classified based on topography, texture and structure of soil, gradient, surroundings, etc. Soil maps should be prepared for the farm.
Soil Health	Minor	Soil health shall be determined based on physical, chemical composition and soil profile observation.

Grower Record

Important details of farming practices should be recorded and records kept.

Type of Farming	Recommended	Records relevant for the type of farming, that is cooperative, contract, lease farming, individual farmer, group farming activity, public/Governmental agencies should be maintained.
Capability	Minor	Grower's accomplishment in farming, technical background in crop production, the skills acquired and knowledge support available shall be documented.
Cropping plans	Minor	The cropping systems and farming systems shall be correctly planned, evaluated and documented, for the next 18 months.
Maintenance of records	Major	Records on crop production, sequence cropping, crop rotations, cropping systems shall be maintained for the cropped area under evaluation.
Retentions period for records	Minor	All records requested during the inspection shall be accessible and shall be kept for a minimum period of two years, unless a longer period is stated in specific requirement.
Internal evaluation	Major	The farmer/society/cooperative body shall undertake internal self inspection on scheduling of crop production practices and shall exercise necessary supervision in their adoption.
Corrective action	Major	Effective corrective actions shall be taken as a result of internal self inspections.

Seed and Planting material

The choice of seeds and planting material plays an important role in the production process and by using the correct varieties can help reduce the number of fertilizer and plant protection product applications. The choice of seeds and planting material is a pre condition of good plant growth and product quality.

Seeds		
Type of Seeds Used	Major	Varieties of seeds recommended by the State Agriculture Universities (SAUs)/National Research Centres (NRCs)/other Government organizations/ Government approved organizations shall be used. If hybrid seeds are used the brand name and if Genetically Modified (GM) crops are used, the Genetic Engineering Approval Committee (GEAC) number, permitting its usage, along with evidence of the source of the seeds shall be recorded.
Quality of Seeds	Minor	The seeds shall have any special quality with reference to freedom from and/or resistance/tolerance to pests/diseases, nutritional / biochemical quality of the produce, germination rate, expiry date, physical or any other characteristics.
Seed treatment	Major	**The seeds, if so, shall be treated with approved fungicides/pesticides. Treated seeds shall be properly identified to avoid accidental use in feed or food. Hazardous chemicals carrying residues to the produce shall not be used for seed treatment.**

Planting material	
Planting Material Used in the Crops	Major
Quality of the Scion Material Used for Grafting/Budding	Minor
Quality of the Clones Used or Hybrid Combination	Minor
Quality of Rootstock Used	Major
Rootstock Production	Minor
Rootstock Treatment Records	**Minor**

Cultural Practices

Soil Preparation	Recommended	The preparation of the soil for growing crop should be according to norms set out by the NRCs/SAUs/other Government organizations/ Government approved organizations or as per the standard practices.
Soil maintenance	Major	Techniques that improve or maintain soil structure, soil solarization and avoid soil compaction and erosion should be used.
Weeding	Recommended	For weed control, approved weedicides or mechanical appliances shall be used or weeds shall be removed manually. Records of practices adopted for adequate weed control shall be maintained.
Field Cultivation	Recommended	Field cultivation techniques to reduce the possibility of soil erosion should be used.

Plant Nutrient Management/Fertilizer Use

Organic Manure		
Method of Organic Manure Preparation	Minor	Methods of organic manure preparation recommended by SAUs/ NRCs/other Government organizations/Government approved organizations shall be followed.
Soil Enrichment	Minor	The soils shall be enriched with adequate organic matter. The organic manure shall be of desired quality.
Nutrient in Organic Fertilizer	Reco	The nutrient contribution of organic fertilizer applications should be taken into account.
Green Manures	Reco	The green manures should be incorporated into the soil to improve soil health.
Bio-fertilizers	Minor	Bio-fertilizers approved by technically competent source shall be applied to the crop.

Inorganic Fertilizers/Nutrients		
Balanced Use of Nutrients	Major	The doses shall be in tune with the soil test crop response studies and/ recommendations of SAUs/ NRCs/other Government organizations/ Government approved organizations for the crop.
Micro-nutrients	Major	The crop requirement of micro-nutrients shall be adequately provided. Compounds being used for micro-nutrients shall contain heavy metals under permissible limit.
Application of Nutrients	Minor	The major/minor nutrients shall be applied through recommended placement practices at appropriate stages of crop growth. Foliar sprays of nutrients shall be done as per standard recommendations.
Competence of the Grower	Reco	The grower should demonstrate her/his competence to determine the type and quantity of fertilizers/nutrients being used and its application.
Fertilizer Equipment	Minor	Fertilizer application machinery/equipment shall be kept in a condition recommended by the supplier.
Fertiliser storage		Fertilizer storage, Reduction in risk of contamination of water, Reduction in risk of contamination of environment, Reduction in risk of contamination of environment

Irrigation/Fertigation

Irrigation/Fertigation Method		
Method of Irrigation/ Fertigation	Minor	The producer shall use efficient method of irrigation/fertigation.
Water Optimization	Reco	There should be a water management plan to optimize water usage and reduce waste.
Record of Irrigation/ Fertigation	Minor	Records of irrigation/ fertigation water usage shall be maintained.

Quality of Irrigation Water		
Quality of Water for Irrigation	Major	Irrigation water shall conform to IS 11624 (Verify the water analysis report).
Risk Assessment Against Contamination of Irrigation Water	Reco	A risk assessment for irrigation/fertigation water pollution should be done.
Frequency of Analysis	Reco	Irrigation water should be analyzed at a frequency in line with the risk assessment.
Competence of the Grower	Reco	The grower should demonstrate her/his competence to determine the type and quantity of fertilizers/nutrients being used and its application.
Action on Adverse Results	Reco	Any adverse results should be acted upon

Source of Water	Minor	The source shall be dependable for assured supply under normal conditions during rain free period.
Water Harvesting and Conservation	Reco	Rain water harvesting and other water conservation techniques should be practiced by the farmer
Maintenance of Irrigation/Fertigation Equipment	Minor	The farmer shall maintain irrigation equipment as per guidelines provided by the manufacturer.
Ban on Untreated Sewage Water/ Industrial Waste Water	Major	The use of untreated sewage water/industrial waste water for irrigation/ fertigation shall be banned.

Crop Protection

Pest Control	**Minor**	**The common pests and diseases endemic to the area and those that occurred on the crop during the past three crop seasons shall be listed out.**
Integrated Pest Management (IPM) Integrated Pest Management (IPM) involves the careful consideration of all available pest control techniques and the subsequent integration of appropriate measures that discourage the development of pest populations, and keeps plant protection products and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment.		Preventive IPM Measures, Soil treatment, Cultural practices, IPM Control Practices, Use of mechanical methods, Use of biological methods, Use of CIB approved chemicals
Plant Protection Products In situations where pest attack will adversely affect the economic value of a crop, it may be necessary to intervene with specific pest control methods, including Plant Protection Products (PPP). The correct use, handling and storage of plant protection products are essential.		Appropriateness of Chemical, Awareness of Banned Chemicals, Appropriate Dosage, Anti-resistance Label Recommendation, Label Instructions on Mixing of Plant Protection Products, Competence of the Grower, Method of Application, Pre-harvest Intervals (Waiting Period), Record of Applications, Disposal of Surplus Application Mix
Plant Protection Product Residue Analysis	Major	A residue analysis of the plant protection product on the produce shall be made at the time of harvest. The correct sampling procedures shall be followed.
Storage of Plant Protection Products	Major	Crop protection products shall be stored as per applicable regulations or as per labelled instructions. Only the authorized competent personnel shall manage the storage areas. All plant protection products shall be stored in their original package.

Crop Protection (continued.)

Handling of Plant Protection Products	**Major**	**The crop protection products shall be handled appropriately and as per standard norms controlling spillage hazards. Only the authorized personnel shall handle the chemicals.** **Health check of workers , Procedures for re-entry of persons, Monitoring of re-entry times, Accident procedures, Prevention accidental contamination, Protective clothing**
Measuring and Mixing Equipment	Major	The farm shall possess appropriate measuring devices and mixing equipment and containers for preparing the desired plant protection products
Storage of Empty Containers	Minor	Empty containers shall be kept secure until disposal is possible.
Disposal of Empty Containers and Obsolete Plant Protection Products	Major	Empty containers and obsolete plant protection products shall be disposed off according to the applicable laws and procedures and necessary records shall be maintained. Re-use of empty plant protection product containers for purposes other than containing and transporting of the identical product shall be avoided.

Crop Maturity

Maturity Standards	**Major**	**Prescribed maturity standards for the crops shall be followed before harvesting.**
Quality Parameter	Minor	The prescribed quality parameters shall be accomplished at the time of harvest.

Harvesting

Method of Crop Harvesting	**Minor**	**The crop harvesting shall be carried out manually or mechanically. The entire crop shall be harvested in a single lot or at different stages depending upon the size of the farm and maturity levels of the produce.**
Appliances used	Reco	Suitable appliances should be used for harvesting to avoid damage.
Hygiene	Major	Hygiene procedures shall be implemented for harvesting the produce
Workplace hygiene	Minor	Farm workers shall have access to clean water, toilets and washing place in the vicinity of their work.

Post Harvest handling

Collection and Assembling of Harvested Produce	**Major**	**Facilities shall be available for assembling of harvested produce in a clean shaded place on the farm. Exclusive containers shall be available for handling of harvested produce.**
Cleaning and Pre-cooling	Major	Cleaning of the harvested produce shall be done by the recommended methods. If required, clean water shall be available for cleaning the produce and for pre-cooling.
Post-harvest treatment	Major	All approved/recommended post-harvest treatments shall be given and recorded.
Grading and sorting	Minor	The product shall be graded, either by using mechanical graders or manually.
Disposal of Waste Produce	Major	All substandard produce and all waste materials shall be kept away from the graded produce and shall be suitably disposed off.

Packaging

Packaging Materials	**Major**	**Packaging materials shall be used in accordance with the recommended specifications, if any or as per the approved hygiene standards and shall have adequate holding strength. Primary packaging materials shall be of food grade quality.**
Labelling and Coding	Major	The packages shall be properly labelled and coded for unique identification and traceability.
Cool Store Handling (Applicable for Fruits and Vegetables Only)	Major	The packages/pallets shall be shifted to the cold store for stabilization of temperature before loading into refrigerated/insulated containers.

Worker Health, Safety and Welfare

Working Conditions	**Minor**	**The recommended working conditions for farm and other operating personnel like dust free environment, etc, shall be practiced.**
Protective Clothing and Gadgets	Major	The workers shall be provided with necessary protective clothing, shoes and other gadgets in tune with the functions assigned to them.
Personal Health	Major	The workers shall be medically examined. The workers with infections diseases, skin infection and open lesion or any other source of microbial contamination shall be excluded from working in farm.
Training of Workers	Major	All workers shall be formally trained on operating farm equipments, application of chemicals, use of protective clothing, basic hygiene and first aid treatment.
Handling of Physical Hazards, for example, Paper, Plastic, Metal, Glass and Wood Residues	Minor	Physical hazards, for example, paper, plastic, metal, glass and wood residues shall be properly handled.
Electrical Installations	Major	All electrical installations on the farm and other working areas shall have adequate safety measures.
Workers' Welfare	Major	A member of the management shall be identified responsible for workers' health, safety and welfare matters.

Environmental Issues

Environmental Safety	**Minor**	**The farming activities shall be environment friendly and compatible with the principles of sustainable agriculture and wild life conservation policy of the state.**

Complaint Procedure

Redress System and Procedures	**Major**	**A complaint form relating to issues of compliance shall be available. The complaints' procedure shall ensure that complaints are adequately recorded, studied and followed up including a record of actions taken.**

Product Recall Procedure

Product Recall Procedure	**Major**	**All producers shall have a documented recall procedure to manage the withdrawal of registered products from the market.**

What to do now?

Give Comment

On the Indian standard and the draft standard

Engage

Enagage in standard formulation process, promotional programs

Adopt

Adopt and implement the National Standard

Improve the standard and make it global

Thanks!

Do you have any questions?

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Standardization in Organic Farming

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100 billion US$

Global market size

9.11 Mill Ha

5th in terms of certified area - India

2.4 million

Organically certified farmers in India

The whole Ecosystem

NPOP

Ministry of Commerce and Industry, Government of India, launched the National Program on Organic Production (NPOP) in the year 2000, which was formally notified in October 2001 under the FTDR Act.

PGS

PGS-India is operated under the Department of Agriculture, Cooperation and Farmers Welfare, MoA&FW

Indian Standard

To prescribe the uniform requirements for organically produced crop based and animal based products both for export and domestic markets.

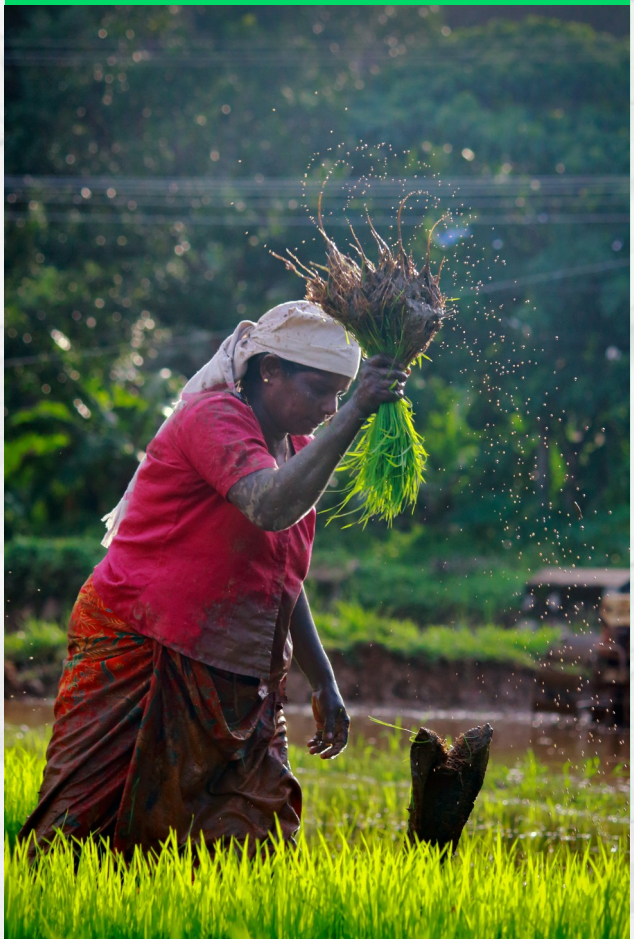
Organic production System

What is this all about?

Conventional Farming
Conventional farming shall mean the farming systems dependent on input of synthetic fertilizers and/or synthetic chemicals and pesticides and synthetic hormones or which are not in conformity with the basic standards of organic production.

Organic Agriculture
Organic agriculture is a system of farm design and management to create an eco system, which can achieve sustainable productivity without the use of synthetic external inputs such as chemical fertilizers, pesticides and synthetic hormones.

Organic crop production management shall cover all agricultural food, fiber crops, herbal, medicinal and aromatic plant crops grown in the country from production to processing as well as collection of non-timber forest produce from the wild forests.



IS 16550

ORGANIC PRODUCTION SYSTEM AND LABELLING OF ORGANICALLY PRODUCED PRODUCTS

- ✓ This standard is published in two parts under the general title organic production system & labelling of organically produced products.
- ✓ Part 1 of this standard covers the requirements for crop based organic production system and labelling of organically produced products and Part 2 of this standard covers the requirements for animal based organic production system and labelling of organically produced products.

Crop production Plan

- ✓ Description of the crops in the production cycle (main crop, intercrop and relay crop) as per the agro climatic seasons.
- ✓ Description of practices and procedures to be performed and maintained.
- ✓ List of inputs used in production along with their composition, frequency of usage, application rate and source of availability.
- ✓ Source of organic seeds and planting material.
- ✓ Descriptions of monitoring practices and procedures to be performed and maintained to verify that the plan is being implemented effectively. Description of practices and procedures to be performed and maintained.
- ✓ Description of the management practices and physical barriers established to prevent mingling and contamination of organic production unit from conventional farms, split production and parallel production.
- ✓ Description of the record keeping system implemented to comply with the requirements of this standard.
- ✓ Procedures governing the production in different farming systems, their documentation, and for preventing ad-mixing of input and

Conversion Requirement

- ✓ If the whole farm is not converted, it shall be ensured that the organic and conventional parts of the farm are separate and capable of being inspected individually.
- ✓ The requirements of this standard shall also be met during the conversion period. All the requirements shall be applicable from the commencement of the conversion period till its conclusion.
- ✓ Simultaneous production of conventional, in conversion and/or organic crops or which cannot be clearly distinguished from each other, shall not be permitted.
- ✓ In case of annual and biennial crops, plant products produced can be claimed as organic when the requirements of this standard have been met during the conversion period of at least 2 years (organic management) before sowing (the start of the production cycle). In case of perennial plants other than grassland (excluding pastures and meadows), the first harvest may be claimed as organic, after at least 36 months of organic management. Pastures, meadows and their products may be claimed as organic after 12 months of organic

Landscape Requirement

- ✓ Organic farming shall contribute beneficially to the ecosystem.

Choice of crop and diversity

- ✓ All seeds and planting material used, shall be certified organic. When certified organic seed and planting materials are not available, conventional seed and planting material (but not treated with chemicals) shall be used.
- ✓ Species and varieties cultivated shall be adapted to the soil and climatic conditions and be resistant to pests and diseases. In the choice of varieties, genetic diversity shall be taken into consideration.
- ✓ Use of genetically engineered seeds, transgenic plants or planting material is prohibited.
- ✓ Where appropriate, the organic farms shall maintain sufficient diversity in a manner that takes into account pressure from insects, weeds, diseases and other pests, while maintaining or increasing soil organic matter, soil

- Permitted 
- Not – permitted 
- “restricted” means that the use of these inputs shall be subject to conditions. Factors such as contamination, risk of nutritional imbalances and depletion of natural resources shall be taken into consideration and as recommended by the relevant Government agencies of the region.

Nutrient Management Requirement

- ✓ Sufficient quantities of biodegradable material of plant and/or animal origin produced on organic farms shall form the basis of the nutrient management programme to increase or at least maintain soil fertility and the biological activity within it.
- ✓ Nutrient management should minimize nutrient losses.
- ✓ Accumulation of heavy metals and other pollutants shall be prevented.
- ✓ Non-synthetic mineral fertilizers and brought-in bio fertilizers (biological origin) shall be regarded as supplementary and not as a replacement for nutrient recycling.
- ✓ Non-synthetic fertilizers shall only be used in a supplementary role to carbon based materials. Only those organic or non-synthetic fertilizers that are brought in to the farm (including potting compost) shall be used when, the circumstances demand.
- ✓ Non-synthetic fertilizers shall be applied in their natural composition and shall not be rendered more soluble by chemical treatment.
- ✓ pH of the soil shall be maintained at optimum level

Pest, Disease and weed Management

- ✓ Weeds, pests and diseases shall be controlled through a number of preventive cultural techniques which limit their development, for example suitable rotations, green manures, early and pre drilling seedbed preparations, mulching, mechanical control and the disturbance of pest development cycles. Measures to prevent transmission of pests, parasites and infectious agents, shall be in place.
- ✓ Pest management shall be regulated by understanding and disrupting the ecological needs of the pests. The natural enemies of pests and diseases shall be protected and encouraged through proper habitat management of hedges, nesting sites etc. An ecological equilibrium shall be created to bring about a balance in the pest predator cycle.
- ✓ Products for pest, disease and weed management, prepared at the farm from local

Contamination Control

- ✓ All relevant measures shall be taken to minimize contamination from outside and within the farm.
- ✓ Buffer zones shall be maintained to prevent contamination from conventional farms.
- ✓ Polyethylene and polypropylene or other polycarbonates coverings such as plastic mulches, fleeces, insect netting and silage rapping, only are allowed. These shall be removed from the soil after use and shall not be burnt.

Soil and Water conservation

- ✓ Soil and water resources shall be handled in a sustainable manner. Relevant measures shall be taken to minimize erosion and other forms of degradation of soil, excessive and improper use of water and the pollution of ground and surface water.
- ✓ Clearing of land through the means of burning organic matter, for example slash-and-burn, straw burning is prohibited. The clearing of primary forest is also prohibited.

Processing & handling requirements

- ✓ Any handling and processing of organic products should be carried out in a manner so as to maintain the organic integrity of the product. The operator shall develop an organic processing and handling plan.
- ✓ Pests should be avoided by good manufacturing practices. This includes general cleanliness and hygiene.
- ✓ There shall be no direct or indirect contact between organic products and prohibited substances (for example pesticides).

Packaging requirements

- ✓ Biodegradable, recyclable, reusable systems and eco-friendly packaging materials shall be used wherever possible.
- ✓ Material used for packaging shall not contaminate food. Certain additives for use in manufacturing of packaging films for packaging of organic food stuffs are allowed for restricted use.

Labelling requirement

- ✓ When all the requirements of this standard are complied with, products shall be sold as “organic products”. Organic products in conversion shall be sold as “produce of organic agriculture in conversion” or of a similar description, when the requirements of this standard have been met for at least 12 months.
- ✓ Where a minimum of 95 percent of the ingredients are of certified organic origin, products shall be labelled “organic”.
- ✓ Where less than 95 percent but not less than 70 percent of the ingredients are of certified organic origin, products shall not be labelled “organic”. The word “organic” may be used on the principal display in statements like “made with organic ingredients” provided, there is a clear statement of the proportion of the organic ingredients.
- ✓ Where less than 70 percent of the ingredients are of certified organic origin, the indication that an ingredient is organic may appear in the ingredients list.

Storage and transportation

- ✓ Product integrity shall be maintained during storage and transportation of organic products.
- ✓ Where only part of the unit is certified and other products are non-organic, the organic products shall be stored and handled separately to maintain their identity.
- ✓ Bulk stores for organic products shall be separate from conventional product stores and clearly labelled to that effect.

Procedure to evaluate additional inputs to organic agriculture

Thanks!

Do you have any questions?

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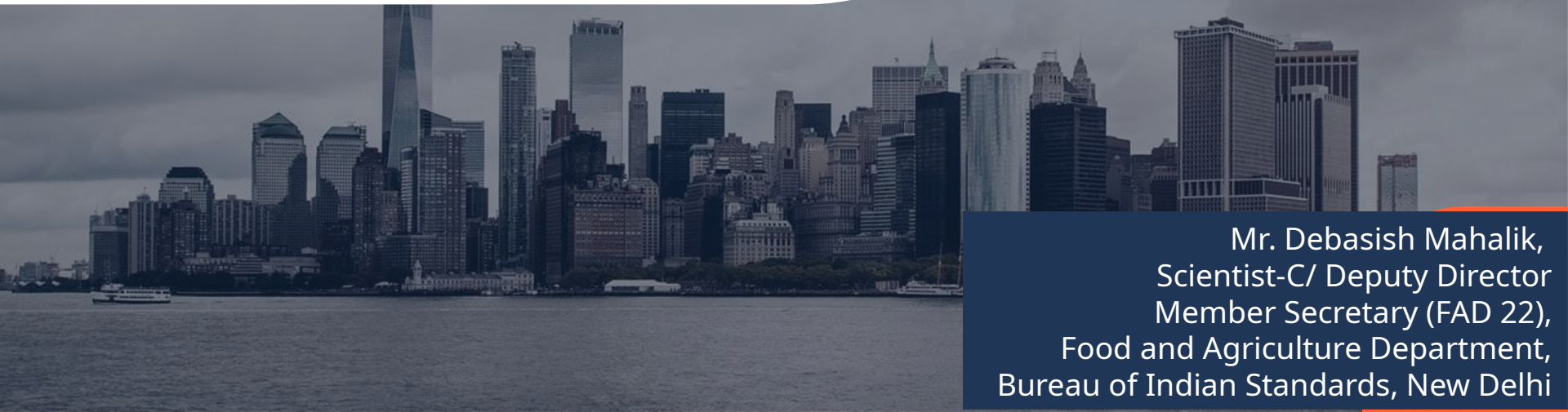
Standardization in Protected Cultivation and Urban Farming



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4 Protected Cultivation technology

Protected cultivation refers to the practice of growing crops in a controlled environment, where factors such as temperature, humidity, light, and ventilation are regulated to optimize plant growth. This is typically achieved through structures like greenhouses, polyhouses, shade nets, or other protective systems. The method protects crops from adverse weather conditions, pests, and diseases, thereby ensuring better growth and productivity.

Protected Cultivation technology

- **IS 14461 : 2024 Surface covered cultivation structures - Glossary of terms**
- **IS 14462 : 1997 Recommendations for layout, design and construction of greenhouse structures**
- IS 14485 : 1998 Recommendations for heating, - Ventilating and cooling of greenhouses
- IS 15175 : 2002 Surface covered cultivation structure - Establishment and operation of mist chamber - Guidelines
- IS 15177 : 2002 Surface covered cultivation - Plastics mulching - Code of practice
- IS 15827 : 2019 Cladding Films for Greenhouse / Polyhouse - Specifications (First Revision)
- IS 15828 : 2009 Design and Construction of Plastic Lined Farm Ponds - Code of Practice
- IS 15830 : 2009 Surface Covered Cultivation - Plastics Mulching Laying Machine - Functional Requirements

IS 14462 : 1997

Recommendations for layout, design and construction of greenhouse structures

- ✓ This standard covers recommendations for layout, design and construction of greenhouse structures.

Requirements

a. Minimum Design Loads for Greenhouse Mainframes
b. Site selection and layout requirements
   - ✓ Selection of Site and Location
   - ✓ Site Layout
   - ✓ Orientation
   - ✓ Headhouse and Storage Facilities
c. Construction requirements
   - ✓ Foundation
   - ✓ Floor
   - ✓ Frame
   - ✓ Structural forms
   - ✓ Covering glazings and material
d. Safety requirements (fire, mechanical, electrical and chemical)
e. Climate Control System in Greenhouse Structures

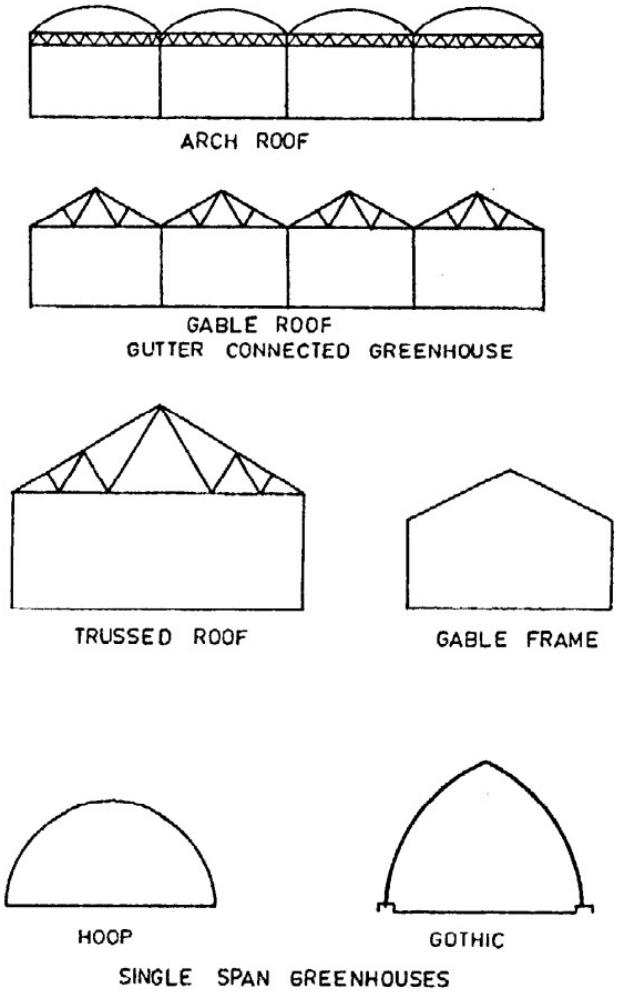


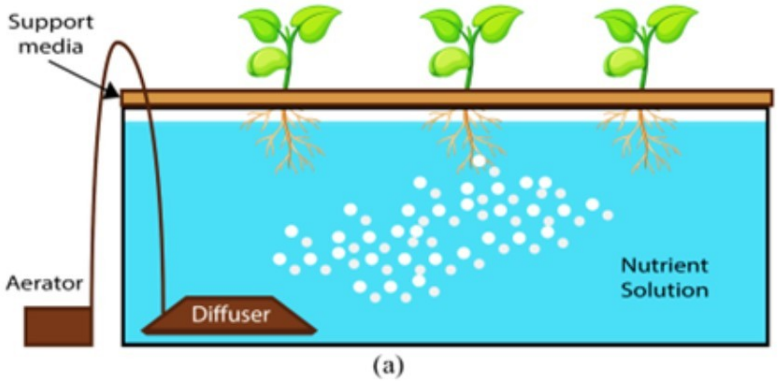
FIG. 2 SOME TYPICAL GREENHOUSE FRAMES

Urban farming technologies

The agriculture which produces, processes and markets food to fulfill daily needs for consumers in a town, city, or metropolitan area by employing efficient methods of production, using and recycling natural resources and city wastes to produce a variety of products and livestock. Plant factories, hydroponics, vertical farming, and rooftop greenhouses are in fact components of a closed-field production system in urban agriculture.

IS 18806: 2024
Hydroponic Farming Production System — Requirements

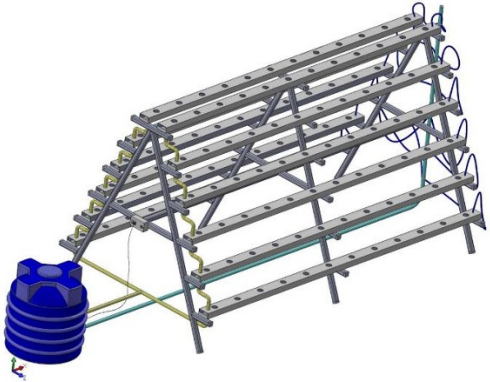
This standard covers the guideline for operation of hydroponic systems including requirements of substrates, nutrient solution and structure design.



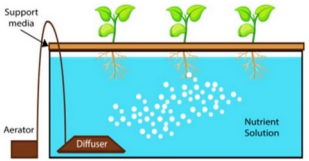
(a)

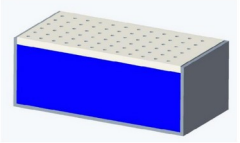
- ✓ Technique of growing plants using a water-based nutrient solution rather than soil, and can include an aggregate substrate, or growing media. Hydroponics is soil-less farming. The word hydroponics comes from the root words ‘hydro’, meaning water, and ‘ponos’, meaning labor, literally ‘working water’.
- ✓ Hydroponic production systems are used by small farmers, hobbyists, and commercial enterprises.
- ✓ Hydroponics was a successful technique used to supply fresh vegetables in many countries and has been considered as the future of farming to grow foods for astronauts in space by NASA.

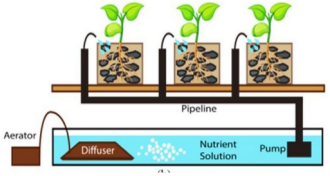
Types of Hydroponics

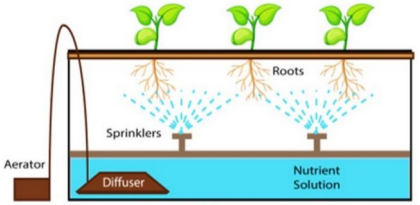


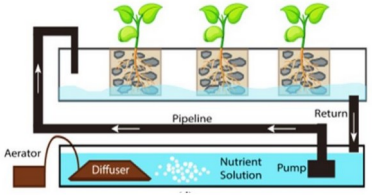
- Floating Root System or Deep-Water Culture (DWC)
- Drip Irrigation
- Aeroponics
- Nutrient Film Technique (NFT)
- Ebb and Flow
- Aquaponics
- Wick pot system
- Vertical Farming

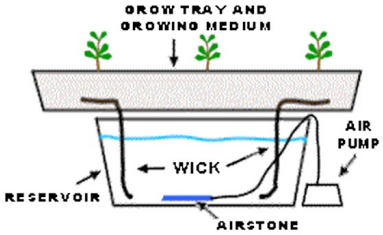


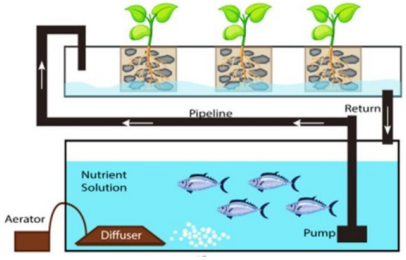












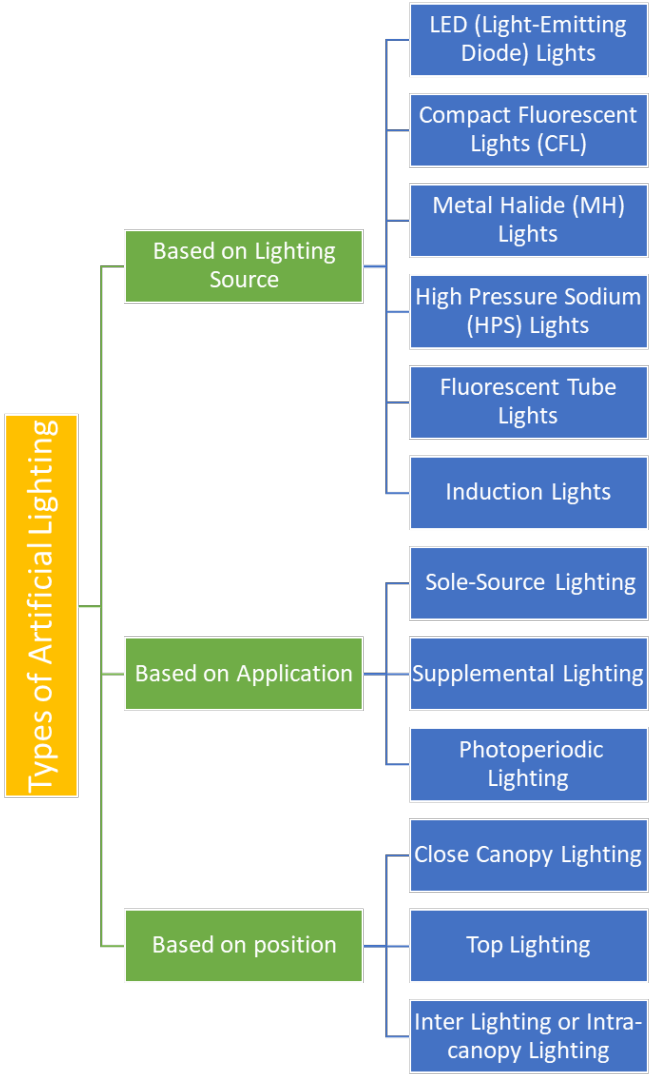
Requirements of Hydroponic System

Requirements of Substrates Used in Hydroponics	Characteristics of Soil-Less Media Substrates	Sustainability Criteria for Choosing Substrates
Characteristics of Nutrient Solution	Crop Selection For Hydroponics	Operational and maintenance requirements

IS 18807: 2024 Artificial Lighting System for Protected Cultivation — Requirements

This standard provides guidelines for the design, installation, operation, and maintenance of artificial lighting systems used in protected cultivation, including but not limited to indoor facilities, vertical farms, greenhouses, and other controlled environments.

- ✓ Light is one of the key requirements for plant growth.
- ✓ Artificial lighting is needed to grow plants in spaces where, there is little or no natural light available or when the natural day length is artificially extended.
- ✓ Artificial lighting system is the electric lighting systems used as a primary or supplemental light source to support plant growth and development in Controlled Environment Agriculture.



Light Quality

- The spectral distribution of light, or the relative number of photons of blue, green, red, far-red, and other portions of the light spectrum emitted from a light source.

Light Intensity

- The energy hitting an area over some time period.
- Important role in photosynthesis, growth and morphology, flowering and fruit production, nutrient intake and plant response.

Lighting Photoperiod

- Duration of light and darkness that plants are exposed to, within a 24 h period.
- Regulating flowering induction, vegetative growth, dormancy, and various physiological processes in plants.

Lighting Uniformity

- Essential for consistent plant growth, optimal light distribution, balanced photosynthesis, avoiding shadowing and hot spots, efficient resource utilization, achieving desired plant responses, improved control and monitoring, and enhanced harvest quality.

Red light promotes flowering and fruiting in many plant species.

Blue light is crucial for vegetative growth, leaf expansion, and chlorophyll synthesis.

Adding green light can help with canopy photosynthesis, because it penetrates further down into plant canopies.

Far-red light influences plant elongation, stem growth, and flowering time.

UV light can induce plant defense mechanisms and affect the production of secondary metabolites, which typically provide flavors and aromas.

Thanks!

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