Certified Greenhouse Farmers

Certification Standard
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1.0 Purpose, Structure and Intended Uses

1.1. Purpose
The purpose of the Standard is to establish a common set of requirements for infrastructure and agricultural production practices in greenhouses which have achieved certification in food safety and have demonstrated investments in advanced technologies. The ecological requirements ensure that an agricultural product has been produced in a distinctly environmentally sound manner. In addition, the Standard is intended to establish guidelines for best management practices that will allow growers a mechanism for internal benchmarking with sustainability practices.

The Standard is in support of the definition of greenhouse grown vegetables as set forth by the Certified Greenhouse Farmers (CGF):

A fully enclosed permanent aluminum or steel structure clad either in glass or impermeable plastic for the controlled environmental growing of certified greenhouse/hothouse vegetables using together computerized irrigation and climate control systems, including heating and ventilation capability; grown in a soilless medium that substitutes for soil (under the greenhouse/hothouse); using hydroponic methods; Integrated Pest Management and without the use of herbicides.

1.2. Structure of the Standard
The framework set forth in this Standard addresses a spectrum of issues – prerequisites, greenhouse design and operation audit, optional ecosystem management and protection – summarized under the following elements:

| Prerequisites                          | - Application with CGF                      |
|                                      | - Audited by Recognized GFSI Third-Party Food Safety Program |
|                                      | - Greenhouse Production Plan                |

| Greenhouse Design and Operation Audit | - Greenhouse Structure and Environmental Controls |
|                                      | - Water Management                           |
|                                      | - Integrated Pest Management                 |
|                                      | - Plant Nutrition Management                 |

| Optional: Ecosystem Management and Protection | - Site Erosion Control |
|                                              | - Habitat Management and Protection |

| Optional: Integrated Waste Management      | - Packaging Resource Minimization |
|                                            | - Management of Product and Other Wastes   |
|                                            | - Management of Hazardous Materials      |

The Standard contains prerequisite requirements and certification requirements (Tier 1), as well as optional best management practices (Tier 2) for future consideration or implementation.
1.3. **Intended Users**
Intended users of this Standard are: 1) agricultural producers; 2) purchasers of agricultural products, including consumers, businesses, institutions, government agencies, and other entities.

1.4. **Voluntary Standard**
This Standard is voluntary to support the certification of CGF membership. It is not intended to replace the legal or regulatory requirements of any country in which agricultural products are produced.

1.5. **Role of SCS as a Certification Body**
This Standard is owned by CGF. The role of SCS is to audit prospective and existing members of the organization to a checklist that has been developed by SCS and is the property of the certification body. The audit serves to validate a member meeting the standards set forth for membership. Certification of a producer to meet these requirements is the responsibility of SCS. A producer may appeal the results of the audit to SCS, at which time SCS will appoint a Committee to review the complaint. The decisions of SCS are final.

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1 See SCS Corporate Complaint, Appeal and Dispute Investigation Procedure (http://www.scscertified.com/docs/SCS_PRO05_ComplaintsAppealsDisputes_V3-1_061209.pdf)
2.0 Goals

2.1 Goals
The major goals of this Standard are:

- To establish core requirements for certification that separate greenhouse growers from growers of field and/or protected culture crops;
- To provide for clear distinction between certified growers and non-certified growers through detailed requirements that range from prior certifications as a prerequisite to advanced design and operational considerations in order to secure safe food and protect the environment;
- To encourage a growing segment of the vegetable production sector to implement better practices in terms of structure and operational procedures;
- To validate production practices as meeting the requirements of CGF, thereby allowing members to use the organization’s trademark, logo, or other messaging on their product, packaging, website, or other approved marketing practices.
3.0 Conformance

3.1 Conformance Requirements
This Standard establishes prerequisite requirements for all greenhouse vegetable producers, and provides two tiers of potential conformity upon which claims may be made. Tier 1 establishes the baseline performance for certified greenhouse production practices, while Tier 2 represents an even higher level of performance involving state-of-the-art or best management practices. In addition, Producers may request that optional sustainability criteria be subject to audit review. Tier 1 and Tier 2 requirements and optional sustainability criteria are described in Sections 4-7 of this Standard.

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In order to be considered conformant to Tier 1 of this Standard, a Producer must conform with all “critical requirements” and must conform with at least 90% of the Tier 1 requirements (prerequisite, critical, and non-critical) in Sections 1 - 5 of the Standard.

For Sustainability recognition, a producer must conform with all "critical requirements" and conform to 90% of the Tier 1 requirements in Sections 4-7 of the Standard, and for Sustainably Excellence, conform with 80% or more of the Tier 2 requirements.

3.2 Scope of Conformance
Conformance may be established solely for a Greenhouse Production Operation. For example, products that are grown in one geographic location on the farm or in some ranges/greenhouse may be in conformance, while the same product grown in another location may not be in conformance. Greenhouses Production Operations must have distinct, defined boundaries that are accurately registered in the specific CGF Program documents.
3.3. Demonstrating Conformance for Public Claims
Producers of vegetable products seeking to make public claims based on this Standard are
governed by CGF. Public claims are not permitted unless compliance has been demonstrated
through the successful passing of a CGF Certification Standard audit.
4.0 **Element 1: Prerequisite Requirements**

This section of the Standard describes general conformance requirements for all greenhouse vegetable producers. The Producer is required to develop and implement written management plans to support the certification objectives outlined in this Standard.

4.1. **Affiliation with the Certified Greenhouse Farmers**

4.1.1. **Proof of Affiliation**

The Producer shall demonstrate proof of application for membership to CGF.

4.2. **Compliance with Food Safety Standards**

4.2.1. **GAP/GMP Audits**

The Producer shall demonstrate that its facilities involved in the production of the agricultural product have undergone a third-party GFSI audit during the previous 12 months in accordance with the relevant U.S. Good Agricultural Practice or Good Manufacturing Practice guidance, or in accordance with more stringent voluntary industry or mandated government requirements. The Producer shall provide evidence of compliance with any required corrective actions that are the result of Immediate Risk or Major Must determinations. Validation of the corrective action shall be subject to review by SCS.

4.2.2. **Food Pathogen Prevention Procedures**

The Producer shall maintain written response procedures in the event that a food pathogen is detected at any point during the chain of custody, including, but not limited to: product quarantine, product recall, client notification, confirmation testing, contaminant source investigation, and corrective action steps.

4.2.3. **Conformance with U.S. or Canadian Food Safety Guidance**

The Producer shall demonstrate that agricultural products have been produced in accordance with U.S. Food and Drug Administration or CGC FSIP-STAN sector-specific guidance principles [Normative References 2 or Additional References 3].

4.3. **Greenhouse Production Plan**

The Producer shall establish and maintain a written Greenhouse Production Plan\(^2\), to be updated and reviewed annually, which describes its agricultural production operations as a means of ensuring that the product conforms to the requirements of this Standard. The Plan shall provide, at a minimum, descriptions of:

\(^2\) The Certification Body will provide the Producer with a form that can be filled in and updated to satisfy this requirement. Greenhouses and hothouses are both included under the Greenhouse Production Plan.
4.3.1. Crop and Farm Information
a. Vegetable types and varieties in production, including any information regarding disease/pest sensitivity and resistance/tolerance, as well as identification of designated agricultural input materials purchased off-farm.
b. Ranges, farm parcels, or greenhouses currently in production or intended for certification, including detailed site maps that place these operations in the context of landscape features, watersheds, natural habitats, and wildlife, and describe adjacent land uses.

4.3.2. Production Techniques and Panting Media
The production process shall be documented, including pre-harvest and post-harvest operations.

4.3.3. Pest/Disease Management
A listing and description of integrated pest/disease management practices and the annual amounts of materials in use, including but not limited to mechanical controls, cultural controls, biological controls, registered synthetic and botanically-derived pesticides, pesticide rotation strategy, monitoring practices and action thresholds, and weed control practices as an alternative to synthetically derived herbicides.

4.3.4. Plant Nutrition Management
A description of the hydroponic methods used for fertility assessments and management. A listing and description of fertilizer regime, including but not limited to: type, application rates, annual amounts used, technologies and quality monitoring (e.g. EC, pH).

4.3.5. Ecosystem Management (optional)
A description of the effects that the Greenhouse Production Operation has had on the site’s ecology, including erosion, flora and fauna species and habitats, and any mitigation efforts undertaken to date; a description of existing and planned vegetated buffer zones for watercourses and between ranges and other areas under cultivation and non-cultivated areas; a list and accompanying maps of any areas of High Ecological Value (HEV), previously identified threatened or endangered habitats or species that are present within the property boundaries and, if known, adjacent to this property, including all facilities and fields, cultivated and uncultivated.

4.3.6. Integrated Waste Management (optional)
Annual documentation of packaging resources used in product packaging and shipping, and the Producers efforts to minimize waste to landfills. Responsible management practices of hazardous materials and non-toxic materials are required along with the development of a comprehensive safety plan.
5.0 Element 2: Greenhouse Design and Operation

This section of the Standard addresses structure and operational procedures and practices employed by the Producer in a greenhouse to manage pests and diseases and provide for essential resources for vegetable production:

- **Greenhouse Structure and Environmental Controls**
  The Producer is required to document that its vegetable production systems have both structural and functional aspects to qualify as a certified greenhouse/hothouse grower.

- **Water Management**
  The Producer is required to conserve water through the use of effective water delivery systems, conservation and monitoring methods and technologies, and the institution of water quality management practices to protect the quality of the product and local water resources.

- **Integrated Pest Management**
  The Producer is required to document its integrated pest and disease management systems, including pest/disease monitoring.

- **Plant Nutrition Management**
  The Producer is required to use a synthetic planting media without soils and a nutritional delivery system with computerized fertility management to liquid feed each plant.

5.1. Greenhouse Structure and Environmental Controls

5.1.1. Tier 1 Requirements for Greenhouse Structure and Environmental Controls

5.1.1.1. Greenhouse Structure and Environmental Controls

The Producer shall describe the structure of the greenhouse in accordance with Section 4.3 of this Standard.

a. The Producer’s greenhouse structure shall be composed of industry-grade materials including, but not limited to the following:
   i. Steel or aluminum structural elements;
   ii. Glass or double poly. (Note that structures with roll-up siding do not comply with this requirement);
   iii. Thermal retention and ventilation features for temperature stability;
   iv. Weed barriers or other floor coverings, and;
   v. A completely enclosed structure (i.e. no roll-up siding or shadehouses).

b. The Producer’s greenhouse must have an operationally functional computer-controlled environment including, as a minimum, the following:
   i. A hot water delivery system (or other centralized heating) in all crop production ranges, and;
ii. Computerized controls in all ranges.

5.1.2. Tier 2 Requirements for Greenhouse Structure and Environmental Controls

5.1.2.1. Greenhouse Structure and Environmental Controls
a. All ranges or greenhouses have double poly or constructed from other high energy efficient materials, and;
b. All ranges or greenhouses have operational energy curtains.

5.2 Water Management

5.2.1. Tier 1 Requirements for Water Resource Management

5.2.1.1. Water Resource Use
a. In accordance with Section 4.3 of this Standard, the Producer shall describe in the Greenhouse Production Plan all surface and underground water currently in use by the Greenhouse Production Operation for all vegetable production processes.
b. The Producer shall also include a description of its irrigation sources found on, or immediately adjacent to, the property, including a map of their locations, and provide references to permits issued by relevant authorities for use of this water, if locally applicable.
c. The Producer shall report its annual irrigation usage, including the amounts for runoff or recycled.

5.2.1.2. Water Conservation Practices
a. In accordance with Section 4.3 of this Standard, the Producer shall describe its current water conservation practices, procedures and infrastructure in the Greenhouse Production Plan.
b. The Producer shall install irrigation systems that minimize water consumption through direct application to the root zone. Impact-type irrigation spraying and flood irrigation shall not be used as a general means for plant production, but may be used in plant establishment.

5.2.1.3. Water Use Monitoring
a. In accordance with Section 4.3 of this Standard, the Producer shall describe in the Greenhouse Production Plan the quantitative methods for determining irrigation needs.
b. The Producer shall put into practice water monitoring methods to accurately monitor water delivery, if such methods are not already in place. Examples of such methods are: load cells, or other checks on water levels in troughs, computerized drip irrigation systems, water flow meters, weather measurement systems to estimate evapo-transpiration from plants, etc.
c. The Producer shall put into practice an on-site means of calculating the irrigation needs, if such methods are not already in place.
5.2.1.4. Water Quality Management
a. The Producer shall monitor the quality of irrigation waters and/or fertilizer concentrates to ensure plant health.
b. If there is evidence of deteriorated water quality associated with the source water or re-circulated water for irrigation (e.g. excessive salts), then the Producer shall institute a wastewater quality monitoring program to detect the potential contamination. This monitoring may include one or more of the following parameters: pH, nitrogen, traceable conductivity (E.C.), etc.

5.2.1.5. Wastewater Treatment and Reuse
a. The Producer shall describe measures to treat and reuse excess irrigation and fertilizers (e.g. thermal, ozone, ultraviolet light, reverse osmosis).
b. The Producer shall ensure that wastewater from industrial and domestic sources are treated separately. Rinsate from the cleaning of agricultural machinery shall be contained to prevent mixing with domestic wastewater.
c. The Producer shall provide wastewater treatment for industrial and domestic wastewater streams and auditable evidence for compliance with applicable local or regional disposal standards (e.g. septic tank permits and county inspection reports). Discharge parameters shall comply with the applicable local or national water discharge legal limits, or meet the EPA or other parameters (e.g. in Canada), and shall be sufficient to prevent the release of contaminants originating from vegetable production processes.

5.2.2. Tier 2 Requirements for Water Resource Management

5.2.2.1. Efficiency in Water Capture
If the Producer is operating in an area where the annual volume of water consumed by the operation is higher than volume of annual precipitation over the production site, then the Producer shall develop, as part of its updated Greenhouse Production Plan, a strategy to improve the efficiency of water capture, if efficiency gains are possible.

5.2.2.2. Recharging Local Aquifer
The Producer shall develop a plan to ensure that water not captured directly or indirectly for use in irrigation shall be allowed to infiltrate to re-charge local aquifers. This requirement is exempted when the volume of annual precipitation over the production site is higher than annual volume of water consumed by the operation.

5.2.2.3. Methods for Monitoring Water Needs and Use
a. The Producer shall produce a detailed site water balance.
b. The Producer shall monitor water consumption for different crops over the production areas or ranges.

5.2.2.4. Water Capture
The Producer shall dedicate an area to water capture that is at least equal to the area dedicated for greenhouse production.
5.2.2.5. Water Use Efficiency
The Producer shall conduct measurements to demonstrate that there is no net increase in water consumption over time relative to unit of production.

5.2.2.6. Employee Training
The Producer shall provide training to managers and workers in the implementation of the Greenhouse Production Plan’s water quality management and water resource conservation protocols and procedures.

5.3. Integrated Pest Management

5.3.1. Tier 1 Requirements for Integrated Pest Management

5.3.1.1. Pest/Disease Management Description
The Producer shall provide relevant and complete information and documentation regarding its pest/disease management (IPM) program in its Greenhouse Production Plan, as required under Section 4.3.3.

5.3.1.1.1. Integrated Pest Management Requirements
a. For each biological or pesticide used on a given crop, the Producer shall maintain auditable records regarding the release dates and amounts or the yearly application amounts, and dates, re-entry times, and product information contained on the label or material safety data sheet (MSDS). Application rates and re-entry periods shall be cross-referenced to the appropriate MSDS by the Producer to ensure the correct amounts are used and that correct re-entry times are enforced to ensure worker safety. These records shall be accessible to all workers concerned and their representatives.

5.3.1.1.2. Pest/Disease Monitoring
a. The Producer shall demonstrate an effective IPM program that includes detailed written procedures for monitoring and reporting of pests and diseases at least weekly. Monitoring records shall include an auditable summary for each compartment or range (e.g. summary tallies of scouting or sticky traps, graphs or other computerized summaries).
b. Direct and/or indirect monitoring of pests and diseases shall be carried out by qualified personnel on a routine basis (e.g. use of insect traps, leaf damage assessment, insect counts, product visual examinations for evidence of infestation, harvest damage assessment, infrared assessments, etc.).

5.3.2. Tier 2 Requirements for Integrated Pest Management

5.3.2.1. Biological, Mechanical and Cultural Controls
The Producer shall strive to use only biological, mechanical or cultural controls as the exclusive methods for controlling pests and diseases.
5.3.2.2. Beneficial Organisms
The Producer shall cultivate or obtain beneficial organisms and their appropriate support structures (e.g. beneficial insects and fungi, beneficial nematodes, and other efficient micro-organisms) for pest or disease control.

5.3.2.3. Pesticide Phase-Out
a. The Producer shall include in the Greenhouse Production Plan a strategy for phasing out any acutely toxic agrochemicals in favor of non-chemical biological, mechanical or cultural methods, or EPA-designated reduced risk or NOP permitted chemicals.
b. The Producer shall be required to submit as part of its Greenhouse Production Plan a written and implemented procedure whereby:
   i. Biological, mechanical and cultural pest/disease control methods are favored over chemical treatment approaches as the principal methods of control for major pests and diseases for each crop; and
   ii. Chemical controls are applied only when biological or economic action thresholds have been exceeded and range records indicate that biological, mechanical or cultural controls are ineffective.

5.3.2.4. Residue Testing
The Producer shall institute statistically valid residue testing as part of its overall quality control monitoring efforts, or provide sufficient test data to demonstrate that monitoring is unnecessary.

5.4. Plant Nutrition Management

5.4.1. Tier 1 Requirements for Plant Nutrition Management

5.4.1.1. Planting Media and Additives
The Producer shall demonstrate that the crops use a self-contained growth media (e.g. a bag) for mechanical support that conforms to the following:
a. Soil-less planting media, such as rock wool, peat moss, sawdust, coco fiber, etc.
b. No soil is used.
c. Auditable records regarding the nutritional products applied, method of application, application rates and dates.

5.4.1.2. Nutrition Delivery System
The Producer shall describe the plant fertility management methods and materials used to conform to the following requirements:
a. Applied fertilizers are electronically controlled through a computerized dosing system.
b. Fertilizer is delivered by drip irrigation and “spaghetti” techniques.
c. Fertilizer reaches individual plant(s).
5.4.1.3. **Determining Plant Nutritional Requirements**
The Producer shall develop and implement a method of assessing plant nutrition requirements (e.g. through visual or chemical foliage analysis).

5.4.2. **Tier 2 Requirements for Plant Nutrition Management**
Currently there are no Tier 2 requirements.
6.0 Element 3: Ecosystem Management and Protection (Optional)

This section of the Standard addresses procedures and practices employed by the Producer to protect the site and the integrity of the local environment including, but not limited to, erosion, waterways, riparian and wetlands habitats, high ecological value habitats and species, and other biologically and culturally significant areas.

- **Site Erosion Control**
  The Producer is required to document that the vegetable production system is erosion-free or that it has implemented an erosion control plan.

- **Habitat Management and Protection**
  The Producer is required to document that the vegetable production system does not negatively affect high ecological value areas, habitats or species.

6.1 Site Erosion Control

6.1.1 Tier 1 Requirement for Site Erosion Control

6.1.1.1 Site Erosion Control
a. The Producer’s site shall be free from sediment run-off or other evidence of fluvial erosion.
b. If evidence of erosion has been detected, the Producer shall provide a timetable for implementation of planned soil conservation and erosion control practices, with performance milestones. Planned efforts shall:
   i. Take into consideration greenhouse sitings, erosion potential and cultural practices for all cultivated and non-cultivated areas; and
   ii. Include procedures for minimizing surface erosion along roads or other heavily used surfaces through proper drainage ditches and other control activities.

6.1.2 Tier 2 Requirements for Site Erosion Control

6.1.2.1 Soil Erosion Control
   The Producer shall provide relevant and complete information regarding current soil conservation and erosion control practices and procedures in the Greenhouse Production Plan, as required under Section 4.3, and shall identify any current soil erosion problems that are directly attributable to the other production operations. Maps of areas subject to erosion, such as steep slopes, gullies, roads, riparian areas and cut banks, shall be included.

6.1.2.2 Existing Buffer Zones for Watercourses and Cultivated Areas
   In accordance with Section 4.3 of this Standard, the Producer shall provide in the Greenhouse Production Plan a description of any existing buffer zones that have been established for watercourses as well as buffer zones between areas under cultivation.
and areas of natural ecosystems or other non-cultivated areas. The description shall address:

a. The types of vegetation planted (native or non-native, perennial or annual);
b. Physical barriers constructed in areas of extreme erosion potential, in areas with excessive movement of materials and/or machinery and where intermittent streams are not fish-bearing; and
c. Procedures in place to ensure that heavy equipment is excluded from all buffer zones, unless used on pre-existing roads.

In addition, the Producer shall develop a timetable for establishing buffer zones in the Greenhouse Production Plan, to be implemented in accordance with Section 8.2.4.

6.2. Requirements for Habitat Management and Protection

6.2.1. Tier 1 Requirements for Habitat Management and Protection

6.2.1.1. Identification of HEV Areas and Listed Habitats and Species

In accordance with Section 4.3 of this Standard, the Producer shall include in the Greenhouse Production Plan a description of areas of High Ecological Value (HEV) within the property boundaries of the Greenhouse Production Operation, and a list of any threatened or endangered habitats or species (e.g. as listed by CITES) that are present within the property boundaries, and, if known, immediately adjacent to this property, including all facilities and fields, whether under cultivation or not.

6.2.1.2. Ecosystem Conservation

The Producer shall not engage in the following activities:

a. Clearing of areas of High Ecological Value for purposes of planting or other activities of the Greenhouse Production Operation.
b. Alteration of natural water bodies and natural water channels.
c. Activities that negatively impact threatened or endangered habitats or species.

6.2.1.3. Effects of Greenhouse Production Operation on Flora and Fauna

In accordance with Section 4.3 of this Standard, the Producer shall provide in the Greenhouse Production Plan a description of the real or potential effects that the Greenhouse Production Operation has had on natural ecosystem flora and fauna as well as a description of any mitigation efforts undertaken in response to these impacts to date.

6.2.2. Tier 2 Requirements for Habitat Management and Protection

6.2.2.1. Description of Potential Contaminant Sources

As required under Section 4.3, the Producer shall provide in the Greenhouse Production Plan a description of current and historic land use practices that have or could result in the discharge of contaminants into surrounding water bodies as a result of pesticide use, fertilizer or compost use, post-harvest treatments or other sources that could leach or run-off into surface water or percolate into groundwater.

3 CITES Species Database, http://www.cites.org/eng/resources/species.html
6.2.2.2. **Watercourse Alterations**
The Producer shall ensure that new crossings, dams, or other human-made alterations to natural watercourses are designed in a manner that does not disrupt the habitat of aquatic organisms (e.g. allowing fish passage).

6.2.2.3. **Protection of High Ecological Value Areas**
If HEVs are present on or adjacent to the Greenhouse Production Operation, then the Producer shall conduct an ecological evaluation of the property and immediately adjacent properties, to determine the types and locations of natural habitats (e.g. woodlands, grasslands, shrub, savannah, riparian, wetlands) and disturbed habitats, and potential risks to ecosystem processes and biodiversity. Sources of expertise shall be consulted as part of the ecological evaluation, such as local university and agency scientists, existing natural heritage databases, and conservation organizations. Where recognized areas of HEV remain within the property boundaries of the Greenhouse Production Operation, the Producer shall implement measures to protect these areas, consistent with the Greenhouse Production Plan. A written summary of the results of this evaluation shall be prepared annually and be available for auditor review.

6.2.2.4. **Ecological Policy Training**
The Producer shall train workers in the implementation of the Greenhouse Production Plan’s stated ecological procedures and practices, and keep records of such training.

6.2.2.5. **Mitigation and Restoration Plan/Set-Asides**
The Producer shall prepare a written mitigation and/or restoration plan, with timetables and performance milestones, for specific habitats or species that have been disturbed or degraded, including designated HEV areas as well as lands that have been cleared by the current owner. Where on-site mitigation and/or restoration is impractical, a plan to establish off-site mitigations such as land set-asides shall be developed, with timetables and performance milestones.

6.2.2.6. **Buffer Zones**
The Producer shall plant new buffer zones with native vegetation.

6.2.2.7. **Terrestrial Carbon Storage and Carbon Credits**
The Producer shall provide an estimate of stored biomass, based on existing terrestrial vegetation (e.g. planted buffer zones, set-asides, windbreaks).

6.2.2.8. **Maintenance/Restoration of Native Species**
The Producer shall take effective steps to maintain or, as needed, restore native species composition within undeveloped areas of the farm not in agricultural use (e.g. watercourse buffer zones, windbreaks, HEV buffer zones). The identified attributes of HEV areas shall not be diminished through operational practices or indirect effects of the operation.
7.0 Element 4: Integrated Waste Management (Optional)

This section of the Standard addresses procedures and practices employed by the Producer to conserve energy and packaging-related resources, and minimize emissions and the potential damage from hazardous waste materials:

- **Packaging Resource Minimization**
  The Producer is required to develop strategies for minimizing the resources used for product packaging, thereby reducing packaging related impacts, without compromising the integrity of the delivered product, through practices such as:
  - reduction of packaging components;
  - use of packaging materials made with recycled content;
  - reuse of packaging materials; and
  - sourcing of packaging materials from sustainable sources.

- **Management of Agrochemical and Other Hazardous Chemicals and Wastes**
  The Producer is required to minimize the danger to workers and the environment through proactive safety policies and standard operational steps that: 1) prevent agrochemical and other hazardous chemical run-off or contamination from vegetable production sites into the surrounding environment; 2) minimize effects to human health and the environment from agrochemical use and other hazardous materials; and 3) ensure proper disposal or recycling of hazardous chemicals and their containers.

- **Management of Product Waste and Other Non-Chemical Waste Management**
  The Producer is required to undertake measures to minimize crop residues, product waste and other non-chemical wastes through practices such as recycling, composting and institution of second harvest programs for edible crops that would otherwise not be harvested and marketed.

7.1. Packaging Resource Minimization

7.1.1. Tier 1 Requirements for Packaging Resource Minimization

7.1.1.1. Packaging and Shipping Materials
  The Producer shall provide a description of all materials used for product packaging and shipping in the Greenhouse Production Plan.

7.1.1.2. Auditable Records
  The Producer shall provide auditable records of amounts of packaging materials used in product packaging and transportation, including the type and quantities of materials used.
7.1.2. Tier 2 Requirements for Packaging Resource Minimization

7.1.2.1. Recycled, Compostable and Sustainable Materials
The Producer shall provide information, when available, about the degree to which packaging components are made from recycled sources, made to be compostable, or made from sustainably sourced materials, including any documentation of such claims. The Producer shall also describe current methods for reusing packaging materials.

7.1.2.2. Material Reduction
The Producer shall assess the potential for:

a. Reducing the volume of packaging per unit of product delivered;

b. Increasing the use of certified recycled or compostable materials;

c. Obtaining materials from certified sustainable sources; or

d. Reusing packaging materials.

Based on this assessment, the Producer shall develop a plan of action to minimize packaging and packaging-related waste, with auditable timelines and performance benchmarks.

7.2. Management of Agrochemical and Other Hazardous Chemicals and Wastes

7.2.1. Tier 1 Requirements for Management of Agrochemical and Other Hazardous Chemicals and Wastes

7.2.1.1. Waste Management Plan
In accordance with Section 4.3 of this Standard, the Producer shall describe in the Greenhouse Production Plan the practices and procedures used for managing agrochemical and other hazardous chemicals and wastes.

7.2.1.2. Agrochemical Storage
The Producer shall comply with the following agrochemical storage requirements:

a. The Producer shall construct agrochemical storage buildings in compliance with local and national building codes and guidelines. Where such guidelines do not exist, the Producer shall assure that buildings are constructed in compliance with the IPCS Safety and Health in the Use of Agrochemicals and FAO Pesticide Storage and Stock Control Manual, including at a minimum:

1. Sufficient ventilation;
2. Impermeable flooring (concrete, cement, or thick polyethylene sheeting);
3. Ramps at entrances to contain any leakage; and
4. Secure doors and windows to prevent unauthorized entry [Add. Ref. 4, Add. Ref. 8].

b. The Producer shall site agrochemical storage facilities in compliance with local and national building codes and guidelines. Where such guidelines do not exist, the Producer shall site buildings in compliance with the IPCS and FAO guidance documents [Add. Ref. 4, Add. Ref. 8]. Buildings shall not be sited in areas subject...
to flooding or environmentally sensitive areas. Exceptions may be made where the Producer can demonstrate that agrochemical storage facilities meet complete containment performance standards.

c. The Producer shall ensure that agrochemical storage areas are clearly marked and signed appropriately and are equipped with emergency equipment that includes, at a minimum:
   i. Sawdust or sand for spills;
   ii. Empty containers and bags to repack damaged or leaking containers;
   iii. Spade and brush;
   iv. Fire extinguisher;
   v. Emergency protective gear;
   vi. Water supply;
   vii. An eyewash kit; and
   viii. Posted emergency procedures.

d. The Producer shall ensure that agrochemical storage facilities have adequate storage capacity and are easily accessed by delivery vehicles.

e. The Producer shall maintain auditable inventory control records.

f. The Producer shall obtain possession permits for all agrochemicals and other hazardous materials that require such documentation for storage.

7.2.1.3. Handling of Agrochemicals and Other Hazardous Substances

The Producer shall comply with the following handling requirements for agrochemicals and other hazardous substances, consistent with IPCS and FAO guidance [Add. Ref. 4, Add. Ref. 7]:

a. A clean and dust-free dispensing table shall be available for agrochemical mixing.

b. Agrochemical and hazardous chemical drums and containers shall be arranged from oldest to newest (i.e. first in first out) to prevent obsolete stock from accumulating.

c. Pallets shall be arranged to allow for free air flow, not over two meters in height and fully accessible for periodic cleaning without ladders.

d. The Producer shall comply with practices for receiving or distributing pesticides as described in the FAO “Pesticide Storage and Stock Control Manual” [Add. Ref. 4].

e. Transportation of agrochemicals and other hazardous substances shall be conducted with great care to avoid damage to containers or contamination of workers or worker equipment not designed specifically for hazardous material use. The Producer shall not accept damaged containers.

f. The transfer of agrochemicals and other hazardous substances shall be performed by trained workers only, and shall be registered on inventory control records.

g. Agrochemicals and other hazardous substances shall not be removed from their original marked containers during transportation or storage.

h. Spillage kits (e.g. sawdust, sand, or other absorption material) shall be available in each area where agrochemicals are mixed.

i. Following any spillage event, spillage should be contained quickly and contaminated materials shall be safely stored prior to site removal.
j. Drums and containers shall be thoroughly inspected at least monthly for leaking seals, split seams and corrosion, and records of inspection shall be maintained.

k. Visibly damaged, leaking or weathered packing materials shall be removed from storage areas and contents shall be transferred to empty containers, which shall be labeled accordingly and noted on inventory control records.

l. Written instructions for mixing of agrochemicals shall be made available to workers.

m. Used chemical containers which may contain hazardous residues shall be returned to the chemical manufacturer or other approved party whenever possible for proper disposal. If this procedure is not possible, then empty containers should be triple rinsed, punctured and landfilled, with rinsate water properly contained to prevent groundwater contamination. Under no circumstances shall used chemical containers be re-used, consistent with the International Code of Conduct for the Distribution and Use of Pesticides and ILO Convention 170 [Add. Ref. 3, Add. Ref. 5].

n. The Producer shall only use landfills or dumpsites, whether on-site or off-site, that have appropriate lining, warning signage, and restricted access.

o. The Producer shall identify one or more individuals who shall be responsible for the storage and handling of agrochemical and hazardous materials as well as employee training.

7.2.1.4. Management of Hazardous Materials

7.2.1.4.1. Tier 1 Requirements for Management of Hazardous Materials

a. The Producer shall establish a written procedure describing safety procedures to be followed in the event of accidents or exposures to hazardous materials and provide instruction in, and enforcement of, proper use of equipment safety guards and personal protective gear, including clothing and additional equipment.

b. The Producer shall provide protective equipment at no cost to all applicable workers. Protective equipment may include: respirators, goggles or face shields, head protection, non-permeable overalls or ponchos, aprons, gloves, rubber boots, hearing protection, etc.

c. The Producer shall provide all workers who handle, mix, or apply agrochemicals with access to eye baths, hand washing and showers after the handling of such chemicals.

d. The Producer shall require workers or others who may be exposed to hazardous chemicals, airborne particulates, or other physical workplace risks, to wear appropriate clothing and additional protective equipment when mixing and applying chemical and biological agents operating machinery.

e. The Producer shall maintain protective equipment in good working order, meeting local occupational health and safety standards. Such equipment shall be replaced by the Producer when deemed necessary, based on corroborated worker reports or external audits.
f. The Producer shall describe procedures in place for ensuring that clothing worn during handling, mixing and application of pesticides does not pose a health risk to workers.

g. The Producer shall ensure that agrochemicals are properly labeled or otherwise identified, that MSDS sheets for agrochemicals are available, and that records of agrochemical use are accessible to all workers concerned and their representatives, as per ILO Convention 170 [Add. Ref. 5].

h. The Producer shall site and design work areas in a manner intended to promote worker safety and prevent risks to the environment, including such considerations as:
   i. Unobstructed access for workers and work vehicles;
   ii. Adequate ventilation and lighting;
   iii. Readily cleanable walls, floors, and surfaces;
   iv. Clearly marked emergency exits and pathways free from obstructions;
   v. Proper containment and storage space for hazardous materials;
   vi. Proper warning signage; and
   vii. Access to emergency equipment such as fire extinguishers.

i. The Producer shall ensure that work equipment that is potentially hazardous to operate is:
   i. Maintained in good working condition;
   ii. Stored safely and clean; and
   iii. Equipped with safety devices, including the use of protective guards placed over moving parts when available.

The Producer shall make operating instructions for safe use available to workers.

j. The Producer shall have an enforced policy prohibiting the presence of any person under age 15 in any place on the property other than a designated suitable area (e.g. child care) or for specific family oriented events. Such areas shall be located away from any chemical spraying, mixing or transporting operations to avoid any potential for exposure.

7.2.1.4.2. Tier 2 Requirements: Management of Hazardous Materials

a. The Producer shall continuously monitor workers’ knowledge of agrochemical application through meetings or other feedback mechanism.

b. The Producer shall ensure that records of the monitoring of the working environment and of worker exposure to hazardous chemicals are kept for a period of no less than five years and are accessible to the workers.

c. The Producer shall provide workers who are using protective equipment (e.g. boots, gloves, masks, suits) to handle, mix, or apply hazardous agrochemicals or other hazardous materials with a clothes changing station where contaminated clothing can be stored separately from street clothes.

d. The Producer shall require that clothing worn during the handling, mixing and application of hazardous agrochemicals be removed on-site, and not
be taken home by workers. Laundering shall be the responsibility of the Producer. Such clothes shall be washed and stored separately from other clothes.

7.2.2. Tier 2 Requirements for Management of Agrochemical and Other Hazardous Chemicals and Wastes

7.2.2.1. Agrochemical Storage and Handling
a. The Producer shall implement a procedure for purchasing agrochemicals that prevents oversupply, and shall phase out long-term storage of agrochemicals, such that agrochemical inventories are limited to the current 12-month period of use.
b. The Producer shall institute inventory controls to ensure accurate monitoring capability, consistent with the 2002 *International Code of Conduct for the Distribution and Use of Pesticides* [Add. Ref. 3].
c. The Producer shall establish decontamination procedures to address accidental spillage of liquid and powdered agrochemicals.

7.3. Management of Product Waste and Other Non-Chemical Wastes

7.3.1. Tier 1 Requirements for Management of Product Waste and Other Non-Chemical Wastes

7.3.1.1. Waste Management Plan
In accordance with Section 4.3.6 of this Standard, the Producer shall describe in the Greenhouse Production Plan the practices and procedures used for managing crop residues, product waste and other non-chemical wastes.

7.3.1.2. Crop Residues and Product Wastes
a. The Producer shall compost crop residues and product, either on or off-site, in a manner that does not negatively impact the surrounding environment.
b. The Producer shall document and maintain auditable records of the dates, volume and/or weight of organic wastes that are composted or burned.
c. The Producer may burn crop stubble on existing farm fields as a soil sterilization procedure, provided that such burning is conducted in accordance with local/regional air quality regulations.

7.3.1.3. Non-Agricultural Wastes from Greenhouse Production Processes
a. The Producer shall properly segregate wastes to facilitate recovery (e.g. organic, plastics, paper, cardboard, wood, metal, other solid wastes) for recycling or disposal in appropriate designated facilities either on or off-site.
b. The Producer shall store segregated wastes intended for future use in a manner that does not impact facility operations or the surrounding environment and is consistent with applicable local and national laws and regulations. During storage, adequate methods shall be used to prevent wastes from leaching into soils or groundwater, and shall prevent waste dispersion (e.g. airborne or water).
c. The Producer shall dispose of wastes that are not recovered in accordance with local/national regulations. On-site waste dumpsites shall be located at least 50 meters from any water body, with the location noted in the Greenhouse Production Plan.

d. The Producer shall document and maintain auditable records of dates, volume and/or weight of non-agricultural wastes that are disposed of.

7.3.1.4. Industrial, Construction and Domestic Wastes
a. The Producer shall dispose of industrial wastes, construction debris or rubble, excavation materials, debris from land clearing, and domestic wastes in accordance with local/national regulations.

b. In the absence of regulations, the Producer shall dispose of wastes in a manner that does not negatively impact the surrounding environment or pose a risk to human health.

c. The Producer shall handle pressure-treated lumber construction debris and wastes in a manner consistent with US Environmental Protection Agency or other local/regional requirements, whichever are stricter; in no case shall such wastes be burned or composted.

d. The Producer shall document and maintain auditable records the dates, volume and/or weight of industrial, construction and domestic wastes that are disposed

7.3.2. Tier 2 Requirements for Management of Product Waste and Other Non-Chemical Wastes
Currently there are no Tier 2 requirements.
Appendix A
Referenced Documents

A.1. Normative References
The following normative documents contain provisions that, through reference in this text, constitute provisions of this Standard.

   http://www.epa.gov/lawsregs/search/40cfr.html


   http://www.epa.gov/oppfeed1/labeling/lrm/chap-07.htm


6. U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition “Food Contaminants and Adulteration.”
   http://www.cfsan.fda.gov/~lrd/pestadd.html

   http://www.who.int/ipcs/publications/pesticides_hazard/en/

A.2. Additional References

   http://www.c DPR.ca.gov/docs/whs/pdf/hs8.pdf

   http://grainscanada.gc.ca/pva-vpa/qsp-psq-231/231-4-eng.htm

   http://ecoport.org/Resources/Refs/Pesticid/Disposal/V8966E/01.htm


   http://www.iucnredlist.org/


Appendix B
Terminology

**Accreditation Body.** The entity which authorizes a third-party entity (see Certification Body) to evaluate the greenhouse growers site and practices in order to conduct certification activities to fulfill the stated purpose of this Standard.

**Action Threshold.** In pest management, the level of pest or disease activity affecting an agricultural crop below which no responsive action is necessitated, and above which pest/disease control is triggered.

**Agricultural Inputs.** All substances or materials used in the production of agricultural products.

**Agricultural Product.** In this Standard, the term refers to the product derived from any food or other crop intended for commercial sale by the greenhouse grower.

**Agricultural Production Unit.** The smallest commercially traded commodity unit for the agricultural product.

**Best Management Practice.** An greenhouse production technique that has been demonstrated on a specific crop in a specific region to have the least environmental and human health impacts of the currently available methods to accomplish a given production outcome, while being economically viable.

**Buffer Zone.** A strip of land located between a sustainable agricultural production operation or portion of such an operation and an adjacent land area that is not under sustainable agricultural production. The buffer zone should be sufficient in size or other features (e.g. windbreaks or a diversion ditch) to prevent activities on one side of the zone from impacting the area on the other side.

**CGF.** Certified Greenhouse Farmers.

**Certification Body.** The certifier conducting the site inspection under the auspices of the accreditation body.

**Compost.** A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.

**Conformance.** Meeting the certification requirements set forth in the Standard.

**Crop.** The vegetable or part of a vegetable intended to be marketed as a greenhouse product and does not include propagation materials or ranges.

**Cultivation.** Digging up or cutting the soil to prepare a seed bed; control weeds; aerate the soil; or work organic matter, crop residues, or fertilizers into the soil.
Cultural Methods. Methods used to enhance crop health and prevent weed, pest, or disease problems without the use of substances; examples include the selection of appropriate varieties and planting sites; proper timing and density of plantings; irrigation; and extending a growing season by manipulating the microclimate with greenhouses, cold frames, or wind breaks.

Discharge. A liquid, gaseous, sludge or solid substance that is released, emitted, or excreted into the surrounding environment and is considered to have ecological and/or human health impacts (e.g. excess nutrients, sediments, pesticides).

Disease vectors. Plants or animals that harbor or transmit disease organisms or pathogens that may attack agricultural crops.

Ecological Restoration. A process of returning ecosystems or habitats to their native structure and species composition.

Ecosystem. The composition of one or more flora and fauna communities in a defined geographic area.

Fertilizer. A single or blended substance containing one or more recognized plant nutrient(s) which is used primarily for its plant nutrient content and which is designed for use or claimed to have value in promoting plant growth.

Field. An area of land identified as a discrete unit within an greenhouse producer’s operation that is not inside a Range.

Food Pathogen. A microbial organism present in food at a level that can cause illness in humans.

GAP Audit. A food safety audit of a crop, conducted in accordance with Good Agricultural Practice standards. Examples include audits consistent with the US FDA Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables and US FDA Guide to Minimize Microbial Food Safety Hazards for Fresh-Cut Fruits and Vegetables.

GMP Audit. A food safety audit of a food storage, processing, handling, or distribution facility, consistent with USFDA Code of Federal Regulations 21.110 and similar Canadian GMP audits recognized by Federal authorities.

Greenhouse Production Operation. The farming enterprise engaged in production of vegetable crops in greenhouses and hothouses.

Greenhouse Production Plan. The written document that describes the protocols and procedures used by the Greenhouse Production Operation in carrying out as a means of partial compliances to the Standard.
Greenhouse Production Process. The series of steps involved in the production of vegetable crops at a specific site, including each phase of media preparation, planting, pest/disease management, fertigation, harvesting, post-harvest handling, storage and shipping.

HACCP. A comprehensive food safety management framework, built around the establishment and monitoring of Hazard Analysis Critical Control Points.

High Ecological Value (HEV) Areas. Those areas that possess one or more of the following attributes:
   a) areas containing globally, regionally or nationally significant concentrations of biodiversity (e.g. rainforest);
   b) areas that are in or contain rare, threatened or endangered ecosystems;
   c) areas that provide basic services of nature (e.g. watershed protection or erosion control) in critical situations;
   d) areas fundamental to meeting the basic needs of local communities (e.g. subsistence or health);
   e) areas critical to local communities’ traditional cultural identity (areas of significance identified in cooperation with such local communities); and
   f) areas that contain threatened or endangered species.

Industrial Chemical Residues. Chemical residues that are present in the environment as a result of industrial activities other than direct agricultural activities associated with a specific food crop.

LD50. The amount of a chemical that is lethal to one-half (50%) of the experimental animals exposed to it. LD50s are usually expressed as the weight of the chemical per unit of body weight (mg/kg). It may be fed (oral LD50), applied to the skin (dermal LD50), or administered in the form of vapors (inhalation LD50).

LOD. The “limit of detection” below which a laboratory cannot confirm the presence of a specific residue in a given commodity.

Lot Number. A unique number that, at a minimum, identifies the Producer, the range(s), and the harvest date(s), and may in addition reflect the number of units packed.

Material Safety Data Sheet (MSDS). A document providing detailed information about the properties and uses of a chemical product or formulation, the nature of the product's hazards, appropriate safe handling procedures and emergency instructions. May also be referred to as Chemical Safety Data Sheet.

Metals. Cadmium, mercury, selenium, arsenic and other metals that either occur naturally in the environment or are introduced into the environment through agricultural or industrial activities. (For metals that are considered micronutrients at low levels, such as selenium, a tolerance level is recognized under the standard.)
Mitigation. To minimize the ecological damage caused by an alteration in the landscape resulting from an agricultural activity through subsequent habitat restoration or through equitable compensation by means of land set-asides or other mechanisms.

Monitoring. To test or sample, especially on a regular or ongoing basis, to evaluate compliance and effectiveness of a given practice, standard operational procedure, or regulation.

Native. Refers to flora or fauna that are indigenous to a given geographic area or bio-geographic province.

Pesticide. Any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, fiber products or animal feedstuffs, insecticides, herbicides, fungicides, fumigants, miticides, rodenticides, nematocides, repellents, algicides, molluscsicides, defoliants, desiccants, inoculants, bactericides, virucides, plant growth regulators, preservatives, and insect growth regulators, agents used to thin fruit or prevent premature fruit fall, and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.

Pesticide Phase-Out A strategy for gradually eliminating acutely and chronically toxic agrochemicals in favor of less toxic non-chemical and biological, mechanical or cultural methods.

Planting Stock. Any plant or plant tissue other than annual seedlings but including rhizomes, shoots, leaf or stem cuttings, roots, or tubers, used in plant production or propagation.

Practices. Cultural techniques including tangible methods and techniques used to complete a task associated with the greenhouse production of an vegetable product.

Practice Standard. The guidelines and requirements through which a vegetable production operation implements a required component of its agricultural production system. A practice standard includes a series of allowed, recommended, and prohibited actions, materials, and conditions to establish a minimum level of performance for planning, conducting, and maintaining functions that are essential to become certified in vegetable production operations.

Procedures. The protocols identified by a Producer or for selecting appropriate practices and materials to be used in implementing the Greenhouse Production Plan (see also SOPs).

Producer. The legal growing entity responsible for the cultivating an agricultural-based consumer crop. A producer may also be involved in product storage, conditioning, packing and shipping operations.

Range. Discrete unit designated for greenhouse production programming and identification.

SOPs. Standard Operating Procedures.
Standard. When capitalized, refers to this standard (Certified Greenhouse Farmers Certification Standard).

Threatened or Endangered Species. Flora or fauna species that have been listed as threatened or endangered with the legal jurisdiction within which an agricultural production operation is doing business, as well as international listings, such as the Red List of the International Union for the Conservation of Nature (IUCN, 2003).

Traceability. The ability to track an agricultural product back to the farm and range of derivation and forward through the chain-of-custody.
## Appendix C

### Pesticides Classified the World Health Organization (WHO) As Extremely Hazardous (Ia) or Highly Hazardous (Ib)

*Tables and Text excerpted from: “The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification: 2004”*

### Table C-1. Extremely hazardous (WHO Class Ia) technical grade active ingredients of pesticides

<table>
<thead>
<tr>
<th>Chemical name / Active Ingredient</th>
<th>CAS no</th>
<th>UN no</th>
<th>Chemical Classification</th>
<th>Physical State</th>
<th>Use</th>
<th>LD50 mg/kg</th>
<th>Remarks</th>
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<tr>
<td>Aldicarb [ISO]</td>
<td>116-06-3</td>
<td>2757</td>
<td>C</td>
<td>S</td>
<td>I-S</td>
<td>0.93</td>
<td>DS 53; EHC 121; HSG 64; IARC 53; ICSC 94; JMPR 1996a</td>
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<td>FM</td>
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<td>F</td>
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<td>3018</td>
<td>OP</td>
<td>L</td>
<td>I</td>
<td>1.8</td>
<td>Extremely hazardous by skin contact (LD50 in rabbits 12.5 mg/kg)</td>
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<td>24934-91-6</td>
<td>3018</td>
<td>OP</td>
<td>L</td>
<td>I</td>
<td>7</td>
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<td>Chlorophacinone [ISO]</td>
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<td>2588</td>
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<td>R</td>
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<td>DS 62; EHC 175</td>
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<td>3027</td>
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<td>R</td>
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<td>OC</td>
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<td>FST</td>
<td>40000</td>
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<td>HG</td>
<td>S</td>
<td>F-S</td>
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<td>L</td>
<td>I</td>
<td>12</td>
<td>DS 14; ICSC 924; JMPR 1998b</td>
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<td>OP</td>
<td>L</td>
<td>I</td>
<td>13</td>
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### Table C-2. Highly hazardous (WHO Class Ib) technical grade active ingredients of pesticides

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<th>Chemical name / Active Ingredient</th>
<th>CAS no</th>
<th>UN no</th>
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<th>Chemical Classification</th>
<th>Physical State</th>
<th>Use</th>
<th>LD50 mg/kg</th>
<th>Remarks</th>
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<td>Acrolein [C] Magnacide</td>
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<td>1092</td>
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<td>Azinphos-methyl [ISO]</td>
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<td>DS 59; ICSC 826; JMPR 1992</td>
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<td>Blasticidin-S</td>
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<td>Butocarboxim [ISO]</td>
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<td>I</td>
<td>158</td>
<td>JMPR 1986a</td>
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</table>


Notes to Class Ia
1. Calcium cyanide is in Class Ia as it reacts with moisture to produce hydrogen cyanide gas. The gas is not classified under the WHO system (see Table 8).
2. Captafo is carcinogenic in both rats and mice.
3. Captafo, Hexachlorobenzene, mercury compounds, parathion, parathion-methyl, and are on the PIC list, see table 7, p. 39
4. EPN has been reported as causing delayed neurotoxicity in hens.
5. Hexachlorobenzene has caused a serious outbreak of porphyria in humans. Hexachlorobenzene is one of the 12 persistent organochlorine pesticides (POPs) banned or severely restricted by the Stockholm convention. See http://irptc.une.org/pops/.
1. Phenylmercury acetate is highly toxic to mammals and very small doses have produced renal lesions: teratogenic in the rat.

The final classification of any product depends on its formulation.
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>EC Number</th>
<th>Class</th>
<th>Toxicity</th>
<th>Notes</th>
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<td>Butoxycarboxim [ISO]</td>
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<td>3-Chloro-1,2-propanediol [C]</td>
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<td>Paris green [C]</td>
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<td>Propetamphos [ISO]</td>
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<td>Sodium cyanide [C]</td>
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<td>Strychnine [C]</td>
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<td>Tefluthrin</td>
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</tbody>
</table>


Notes to Class II
1. 1,3-chloro-2,3-propanediol in nonlethal dosage is a sterilant for male rats. This compound is also known as alphachlorohydring.
2. Fluoroacetamide, methamidophos, monocrotophos, and pentachlorophenol are on the PIC list; see Table 7, p. 39.