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## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

**30 Foreword**

31  
32 In 2006, the ASEAN Member States prepared and adopted the ASEAN Good  
33 Agricultural Practices (ASEAN GAP) which sets out the minimum requirements to be  
34 applied during the production, harvesting, and postharvest handling to ensure food  
35 safety and quality of fresh fruits and vegetables. Consequently, a Strategic Plan was  
36 developed for sustaining the immediate and long-term development and use of the  
37 ASEAN GAP standard.

38  
39 The ASEAN-German Cooperation Project on Standards for the Southeast Asian Food  
40 Trade (SAFT) supported the implementation of priority activities identified by Expert  
41 Working Group for ASEAN GAP, particularly the alignment of national standards with  
42 ASEAN GAP using an agreed tool. The Philippines was identified as the lead country for  
43 the regional initiative.

44  
45 The Technical Working Group (TWG) that developed the Philippine Code of Good  
46 Agricultural Practices (GAP) was reconstituted per Special Order No. 498 series of 2016  
47 to facilitate the review and revision of the standard to fully-align it with ASEAN GAP. The  
48 project is a collaborative effort of experts from the Bureau of Plant Industry (BPI),  
49 Agricultural Training Institute (ATI), Bureau of Soils and Water Management (BSWM),  
50 Fertilizer and Pesticide Authority (FPA), University of the Philippines at Los Baños  
51 (UPLB), Central Luzon State University (CLSU), Control Union Philippines, and Bureau  
52 of Agriculture and Fisheries Standards (BAFS). The TWG, through several meetings,  
53 prepared the draft standard for presentation on a public information forum held in  
54 Quezon City (NCR) in order to raise awareness of stakeholders on the revisions, before  
55 the document was finalized and adopted as Philippine National Standards (PNS).

56  
57 The practices in this Code of GAP are aimed towards prevention and minimization of  
58 risk occurrences which include those of food safety, environmental impact, worker  
59 health, safety and welfare, and product quality in the primary production and postharvest  
60 handling of fresh produce intended for human consumption. It is envisioned that  
61 compliance of farmers with this set of practices will enhance the trade and  
62 competitiveness of the country's agricultural products as well as promote consumer  
63 protection against food safety hazards.

64  
65 Major modifications in this revision includes: i) adoption of some provisions of ASEAN  
66 GAP; and ii) addition of new section on Documentation and Records.

67  
68 This standard cancels and replaces PNS/BAFPS 49:2011.

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72  
73  
74

## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

75 **1 Scope**

76  
77 This standard code of practice covers the general hygienic practices for the production  
78 and primary processing of fresh fruits and vegetables cultivated for human  
79 consumption, particularly those intended to be consumed raw. Specifically, this code is  
80 applicable to fresh fruits and vegetables that are field-grown with or without cover, or  
81 those grown under protected facilities such as hydroponic systems or greenhouses.

82  
83 This standard code does not apply to production of sprouts, fresh cut products and  
84 other products that are covered by separate production or certification standards

85 **2 References**

86  
87  
88 The titles of the standards publications referred to in this standard are listed on the  
89 inside back cover.

90 **3 Definitions**

91  
92  
93 For the purpose of this standard, the following terms shall apply:

94 **3.1 agricultural inputs**

95 any incoming material (e.g. seeds, fertilizers, water, agricultural chemicals, plant  
96 support, etc.) used for the primary production of fresh fruits and vegetables

97 **3.2 agricultural worker**

98  
99 any person that undertakes one or more of the following: cultivation, harvesting and  
100 packing of fresh fruits and vegetables

101 **3.3 antimicrobial agents**

102  
103 any substance of natural, synthetic or semi-synthetic origin which at low  
104 concentrations kills or inhibits the growth of microorganism but causes little or no  
105 host damage

106 **3.4 biological control**

107  
108 the use of competing biologicals (such as insects, microorganisms and/or microbial  
109 metabolites) for the control of mites, pests, plant pathogens and spoilage organisms

110 **3.5 biopesticide**

111  
112 a pesticide that is manufactured from biological sources

113 **3.6 biosolids**

114  
115 sludge and other residue deposits obtained from sewage treatment plants and from  
116 treatments applied to urban and industrial wastes (food industry or other types of  
117 industries)

118  
119  
120

121 **3.7 cleaning**

122 the removal of soil, dirt, grease or other foreign matter

123

124 **3.8 clean water**

125 water that does not compromise food safety in the circumstances of its use

126

127 **3.9 composting**

128 a managed process where organic materials are subjected to moisture, heat and  
129 microorganisms for a specified period to produce a product known as compost

130

131 **3.10 contamination**

132 **food safety context:**

133 the introduction or transfer of a food safety hazard to produce or to the inputs that  
134 contact produce, such as soil, water, chemicals, equipment and people

135

136 **environmental context:**

137 the introduction or occurrence of a hazard into the environment

138

139 **3.11 domestic animals**

140 animals that are raised as family pets or as a source of food for the family – for  
141 example dogs, cats, cows, chickens, ducks, birds, sheep, monkeys, mice, rabbits

142

143 **3.12 farm animals**

144 animals that are raised for agricultural and commercial purposes- for example,  
145 cows, carabaos, sheep, chickens and ducks

146

147 **3.13 fertigation**

148 the application of nutrients through irrigation

149

150 **3.14 fertilizer**

151 includes any substance – solid or liquid – or any nutrient element or elements – organic  
152 or inorganic – singly or in combination with other materials, applied directly to the soil  
153 for the purpose of promoting plant growth, increasing crop yield or improving their  
154 quality

155

156 **3.15 FPA certified pesticide applicator (Agricultural category)**

157 refers to one who has attended training course and passed an examination administered  
158 for such purpose of safe use including storage, disposal of pesticide by the FPA

159

160 **3.16 food safety hazard**

161 any chemical, biological or physical substance or property that can cause fruit and  
162 vegetables to become an unacceptable health risk to consumers

163

164

165

166 **3.17 fumigation**

167 the application of a chemical to control pests in the soil or substrate, such as insects,  
168 diseases and weeds

169  
170 **3.18 hazard**

171 a biological, chemical or physical agent in, or condition of, food with the potential to  
172 cause an adverse health and environmental effect/s

173  
174 **3.19 integrated pest management**

175 a pest management approach that uses all available pest control methods including but  
176 not limited to judicious use of pesticides, to optimize a crop's ability to resist the pest with  
177 the least hazard to man and the environment

178  
179 **3.20 manure**

180 animal excrement which may be mixed with litter or other material, and which may be  
181 fermented or otherwise treated

182  
183 **3.21 maturity index**

184 a method used to measure or predict the maturity of fruit and vegetables

185  
186 **3.22 maximum residue limit (MRL)**

187 the maximum concentration of a pesticide residue (expressed as mg/kg) recommended  
188 by either Codex Alimentarius Commission or national competent authority to be legally  
189 permitted in or on food commodities and animal feeds. MRLs are based on GAP data  
190 and foods derived from commodities that comply with the respective MRLs are intended  
191 to be toxicologically acceptable.

192 **3.23 obsolete chemical**

193 a chemical that is no longer suitable for use. For example approval for use of the  
194 chemical may be withdrawn, the chemical is older than the use by date, the  
195 container may be damaged and the chemical soiled

196  
197 **3.24 organic material**

198 a material originating from plants and animals and not from synthetic sources

199  
200 **3.25 packing**

201 the action of putting fresh fruits and vegetables in a package. This may take place in a  
202 field or in the establishment

203  
204 **3.26 pest**

205 an unwanted animal or plant that affects the production, quality and safety of fruit  
206 and vegetables – for example, insects, diseases, weeds, rodents and birds

207  
208  
209

**3.27 pesticide**

any substance or product, or mixture thereof, including active ingredients, adjuvants and pesticide formulations, intended to control, prevent, destroy, repel or mitigate directly or indirectly, any pest. The term shall be understood to include insecticide, fungicide, bactericide, nematocide, herbicide, molluscicide, avicide, rodenticide, plant regulator, defoliant, desiccant and the like

**3.28 pesticide residue**

means any specified substance in food, agricultural commodities, or animal feed resulting from the use of a pesticide. The term includes any derivatives of a pesticide, such as conversion products, metabolites, reaction products, and impurities considered to be of toxicological significance

**3.29 potable water**

water that is suitable for human consumption as approved by WHO or equivalent regulations

**3.30 pre-harvest Interval (PHI)**

refers to the number of days between the last spraying and harvest. It is derived from a supervised pesticide residue trial where the pesticide is applied at the recommended rates and the residue levels are analyzed. Each pesticide active ingredient or AI has its own PHI

**3.31 primary processing**

the part of a food processing plant that receives raw materials and prepares them for further processing, e.g. by cleaning, milling or separating

**3.32 re-entry period**

refers to the period of time immediately following the application of a pesticide during which unprotected workers should not enter a field

**3.33 risk**

the chance of something happening that will impact upon a hazard (for example, food safety). It is usually measured in terms of likelihood and consequences

**3.34 sanitize**

reducing the level of microorganisms through using chemicals, heat and other methods

**3.35 sensitive areas**

areas at high risk of environmental harm from chemicals, water, nutrients, waste, and so on, originating from property activity. Examples include biodiverse areas, other crops, livestock areas, water sources, marine areas, wetlands, native fauna and flora, soils, neighboring properties and public areas

**3.36 site**

a defined area on the property – for example, a production site

258

**3.37 soil additives**

products or materials that are added to the soil to improve fertility, structure or control weeds. Examples are animal manure, sawdust, compost, seaweed, fish-based products

263

**3.38 traceability**

the ability to follow the movement of produce through the specified stages of production and distribution

267

268

**4 Recommended practices**

270

**4.1. Site history and management**

272

**Suitability of the agricultural site for food production and primary processing**

274

**4.1.1** Management of site activities conforms to country environmental legislation covering air, water, noise, soil, biodiversity and other environmental issues.

277

**4.1.2** In the case of new site(s), the risk of causing environmental harm within or outside the site should be assessed for the proposed use. Risk assessment should consider the prior use of the site and potential impact of adjacent sites to the new site(s).

281

**4.1.3** If results of the evaluation of the production or adjoining sites lead to the conclusion that potential hazard exist, the sites should be further evaluated through analysis and characterization of the identified contaminants.

285

**4.1.4** If the contaminants are found to be at unacceptable levels, the site should not be used for production and primary processing until corrective or control measures are carried out.

289

**4.1.5** Whenever remedial action is required to manage the risk, the action taken should be monitored to ensure that contamination of the produce is eliminated or kept within acceptable levels.

293

**Production site and property map**

295

**4.1.6** A property lay-out map within the site should be prepared to indicate the locations of the following:

298

- crop production area;
- primary processing area;

300

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- 301 • sources of water used on the farm (well, reservoir, rivers, lakes, farm ponds, etc.)
- 302 • chemical pesticides and fertilizer storage and mixing areas;
- 303 • tools and equipment cleaning and disinfection areas;
- 304 • storage area for tools and equipment;
- 305 • post-harvest chemical treatment area;
- 306 • water storage, distribution networks, drainage, and discharge points of waste water;
- 307 • solid waste disposal area;
- 308 • composting areas;
- 309 • property buildings, structures and road networks;
- 310 • toilet facilities and hand-washing areas; and
- 311 • environmentally sensitive and highly degraded areas (e.g. saline/sodic soil)

312

313 **4.1.7** Each production area, in case of multiple production areas in a site, should be  
314 identified by a name or Code, and must be indicated in the property map.

315

## 316 **4.2. Planting material**

317

### 318 **Selection of planting materials considers soil and site suitability/compatibility**

319

320 **4.2.1** Aside from yield quantity and quality as basic considerations, varieties to be grown  
321 should be selected based on market requirements, grower preference and adaptability  
322 to the locality. Other considerations may include soil type and nutrient levels, water  
323 availability, prevailing temperatures and humidity, insect pest population  
324 dynamics, and presence of inocula of major pathogens.

325

326 **4.2.2** For efficient chemical, water and other input utilization, planting materials may be  
327 selected based on their nutrient and water use efficiencies, and pests and diseases  
328 resistance.

329

330 **4.2.3** Crop varieties/species known to be toxic for human consumption are not grown.

331

### 332 **Source of planting material, the necessary seed treatments and related** 333 **documents**

334

335 **4.2.4** The seed and planting materials should be of high quality. Sourcing and/or  
336 procurement of seed and planting materials from the Accredited Seed Growers or Plant  
337 Nursery Operators are encouraged.

338

## 339 **4.3 Soil and soil conservation**

340

341 **4.3.1** Recommended soil conservation measures such as: minimum tillage, contour  
342 planting, crop rotation, etc. should be integrated in the crop production practices in order  
343 to improve or maintain the soil structure and tilth, and minimize soil compaction and  
344 erosion.

345 **4.3.2** Use of crop suitability maps to plan crop rotation and production programs is  
346 encouraged.

347

#### 348 **Use of soil fumigants to sterilize the soil**

349

350 **4.3.3** The use of chemical fumigants and alternatives to sterilise soils and  
351 substrates is justified. The farm should not use banned chemical fumigants and other  
352 practices not allowed under country environmental legislations.

353

#### 354 **4.4 Fertilizers and soil additives**

355

356 **4.4.1** To optimize nutrient use and minimize nutrient losses, the farm should apply  
357 fertilizers based on the quantitative information on soil nutrient based on soil analysis or  
358 leaf or sap analysis.

359

360 **4.4.2** Fertilizers and soil additives should be judiciously selected to minimize the risk  
361 of contamination of produce, particularly with the heavy metals. Only duly registered  
362 fertilizers (inorganic and bio/organic) should be used.

363

364 **4.4.3** In the case that potting mix (e.g. coco peat, peat moss, rice hull, compost) is used  
365 in the farm, the name of the source or supplier should be documented.

366

367 **4.4.4** For hydroponic production systems, the mixing, application and disposal of the  
368 nutrient solution is monitored and recorded.

369

#### 370 **Organic fertilizer**

371

372 **4.4.5** Composting areas should be separated from the crop production area and from  
373 drinking and farm water sources.

374

375 **4.4.6** Untreated (undecomposed) organic materials must not be applied because the  
376 presence of potential contaminants may affect the produce. Organic fertilizer materials  
377 should be treated prior to application.

378

379 **4.4.7** Production procedures, such as: composting, solarization, heat drying, etc.,  
380 should be designed to reduce or eliminate pathogens in manure, biosolids and other  
381 natural fertilizers.

382

#### 383 **Human sewage**

384

385 **4.4.8** Human sewage whether processed or unprocessed must not be used for  
386 production of fresh fruits and vegetables.

387

388

389

390

391 **Equipment maintenance**

392  
393 **4.4.9** Equipment used for the application of fertilizers and soil additives should be  
394 maintained in good working condition and should be checked regularly by a technically  
395 competent person.

396  
397 **Storage facility and management**

398  
399 **4.4.10** Areas or facilities for storage, mixing and loading of fertilizers and soil  
400 additives and for composting of organic materials should be constructed as far away as  
401 possible from the water source. These facilities should be properly maintained to  
402 minimize the risk of contamination of production areas and water sources.

403  
404 **4.4.11** For the storage of fertilizer materials:

- 405
- 406 • Storage area must be separated from other agro-chemical products to prevent  
407 cross contamination;
  - 408 • The storage area should be well-ventilated and appropriately covered to protect  
409 inorganic fertilizers, such as powder, granules or liquids from sunlight, rain,  
410 humidity, and other atmospheric factors;
  - 411 • Storage area should be free from waste, does not constitute a breeding place for  
412 rodents, and where spillage and leakage is easily cleared away;
  - 413 • All inorganic fertilizers should be stored in a prescribed manner to avoid or  
414 minimize risk of contamination to water sources. For instance, liquid fertilizers must  
415 be banded and proximity of water courses and flood risks, etc. should be considered;  
416 and
  - 417 • Fertilizers should not be stored with harvested crop or yield and plant  
418 propagation materials.

419  
420 **4.4.12** The utilization of inorganic fertilizer should observe First-In First-Out practice  
421 (FIFO).

422  
423 **Disposal of left-over fertilizers, used nutrient solutions and containers**

424  
425 **4.4.13** Leftover fertilizers and unused nutrient solutions, if any, should be properly  
426 disposed.

427  
428 **4.4.14** Used inorganic fertilizer containers should be disposed according to  
429 approved label recommendations.

430  
431 **4.5 Water**

432  
433 **Source of irrigation water**

434  
435 **4.5.1** The risk of chemical or biological contamination of produce from the water  
436 used for irrigation, fertigation, application of chemicals, washing, treatments,

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437 cleaning, sanitation and other forms of handling the produce should be assessed.  
438 Particular attention should be given especially for those crops that are grown close to the  
439 ground. Moreover, the proximity of water sources on possible sources of contamination  
440 (e.g. near the dumping site, near septic tanks, etc.) should be considered during  
441 assessment.

442  
443 **4.5.2** Where water testing is required to assess the risk of contamination, tests should be  
444 conducted at a frequency appropriate to the degree of potential risk from the water  
445 supply.

446  
447 **4.5.3** Where the risk of chemical and biological contamination of produce is significant,  
448 an alternative water source should be developed or necessary water treatment should  
449 be done.

450  
451 **Suitability of water quality for agricultural production**

452  
453 **4.5.4** Irrigation use is based on crop water requirements, water availability, soil moisture  
454 levels, and consideration of environmental impact on and off the site. Water used for  
455 agricultural purposes should be of suitable quality for its intended use.

456  
457 **Quality of water used for fertilizer and pesticide application**

458  
459 **4.5.5** Water used for the application of water-soluble fertilizers and agricultural chemicals  
460 in the field or indoor growing facility should not contain microbial, chemical and physical  
461 contaminants at levels that may adversely affect the safety of fresh fruits and  
462 vegetables.

463  
464 **Efficiency use and management of water**

465  
466 **4.5.6** Water collection, storage, delivery and use should be managed.

467  
468 **4.5.7** The irrigation system is checked for operational efficiency during each use  
469 according to operator's instructions or other appropriate methods and maintained to  
470 ensure efficient delivery.

471  
472 **4.5.9** Water from toilets and drainage systems are disposed of in a manner that  
473 minimizes the risk of health and environmental harm on and off the site.

474  
475 **4.5.10** Water used from sources that may cause environmental harm to the land and soil,  
476 waterways and sensitive areas should be managed or treated to minimize the risk of  
477 health and environmental harm.

478  
479 **Untreated sewage water**

480  
481 **4.5.11** Untreated sewage water should not be used for irrigation or fertigation. Whenever  
482 treated sewage water is used, water quality should comply with the WHO 1989

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483 published Guidelines for the Safe Use of Wastewater and Excreta in Agriculture  
484 and Aquaculture, or the country's guidelines on the matter which is the Department of  
485 Environment and Natural Resources (DENR) Clean Water Act, specifically on use of  
486 waste water. Otherwise, untreated sewage water should not be used during production  
487 and postharvest handling of produce.

488

**4.6 Crop protection**

489

**Choice of crop protection products**

490

491 **4.6.1** Crop protection measures should be appropriate for the control of pests and based  
492 on the approval of the competent authority.

493

494 **4.6.2** Growers should use agricultural chemicals that are registered for the  
495 cultivation of the specific fruit or vegetable and procured from licensed suppliers and  
496 approved by the competent authority in the country where the crop is grown and in the  
497 country where the produce is intended to be traded. The use of such agricultural  
498 chemicals must be in accordance with the approved label instructions for the  
499 intended purpose/s.

500

501 **4.6.3** If the choice of chemical products is made by advisers, proof of their technical  
502 competence should be made available such as certificates of trainings, education,  
503 experience and accreditation from competent authority.

504

505 **4.6.4** The expiry dates of the chemicals to be procured should be considered. The  
506 expiration date is 2 years after the formulation date indicated on the label.

507

508 **4.6.5** These should be applied at approved dosages to prevent residue levels exceeding  
509 the maximum residue limits (MRLs).

510

511 **4.6.6** The produce shall be subjected to residue analyses to be conducted by an  
512 accredited laboratory.

513

514 **4.6.7** Up to date information on chemical MRL standards for the country where produce  
515 is intended to be traded, is available from a competent authority.

516

517 **4.6.8** If chemical residues in excess of the MRL are detected in the country where  
518 produce is traded, marketing of the produce is ceased. The cause of the contamination is  
519 investigated, corrective actions are taken to prevent re-occurrence, and a record is kept  
520 of the incident and actions taken.

521

**Mixing of crop protection products**

522

523 **4.6.9** The mixing area should be located and chosen in such a way that the risk of  
524 contaminating the workers and the environment are minimized.

525

526

527

528

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529 **4.6.10** Mixing of agricultural chemicals should be carried out in a manner that will  
530 prevent ground and surface water contamination and the land in the surrounding areas.

531  
532 **4.6.11** The filling and mixing areas for the crop protection product should be  
533 equipped with appropriate tools for precise measurements and calibrations. The  
534 functionality of such should be checked before every cropping season by the  
535 grower/applicator. The filling and mixing areas should have floor brush, dustpan,  
536 plastic bags and adsorbent materials such as sand. These materials should be placed  
537 in a fixed location within the specific area, to be used in case of spillage of crop  
538 protection product.

539  
540 **4.6.12** Emergency facilities in the event of accidental spill during mixing should be  
541 readily available.

542  
543 **4.6.13** Prepare only the necessary volume of spray solution to avoid surplus application  
544 mix.

545  
546 **4.6.14** Surplus application mixes are disposed of in a manner that does not present a  
547 risk of contaminating the produce.

548  
549 **Application of crop protection products**

550  
551 **4.6.15** The person responsible for application should be technically competent. He  
552 should possess the relevant trainings and experience, education or preferably be  
553 duly accredited as such by a competent authority (e.g. FPA).

554  
555 **4.6.16** The Integrated Pesticide Management (IPM) principles and techniques  
556 should be used whenever possible to minimize the use of pesticides. A rotation strategy  
557 for chemical application and other crop protection measures should be employed to  
558 avoid the development of pest resistance, i.e. use different chemical groupings (e.g.  
559 organophosphates, synthetic pyrethroids, carbamates, etc.) of pesticides.

560  
561 **4.6.17** The tank mixing of more than two (2) chemicals should be avoided, unless  
562 recommended by FPA, or specified in the product label.

563  
564 **4.6.18** Growers/applicators should observe established Pre-harvest Intervals (PHIs)  
565 or the period between chemical application and harvest.

566  
567 **4.6.19** Appropriate warning signs should be placed on a newly applied or is being  
568 applied area.

569  
570 **4.6.20** Workers should use well-maintained protective clothing during applications and  
571 observe established Re-entry Periods.

572  
573 **4.6.21** Ground or aerial application of chemicals should be managed appropriately to  
574 minimize the risk of spray drift to neighboring properties and environmentally sensitive

575 areas. In such cases, areas applied with pesticides should be marked with appropriate  
576 warning signs for public safety.

577

### 578 **Safety and Welfare of Authorized Worker/s during Application**

579

580 **4.6.22** Authorized farm workers should be trained on the proper handling (e. g.  
581 application) of crop protection products. (for TWG discussions).

582

583 **4.6.23** Material safety data sheets (MSDS) or safety instructions from approved  
584 labels should be made readily available for reference.

585

586 **4.6.24** First aid facilities (e.g. kits) should be readily available to treat workers of  
587 minor cuts and bruises and those that have been accidentally contaminated with  
588 chemicals prior to medical attention/treatment in a hospital.

589

590 **4.6.25** First-aid and emergency instructions should be documented and  
591 conspicuously displayed in strategic locations.

592

593 **4.6.26** Authorized workers who are directly handling and applying chemicals should  
594 undergo pre-employment, periodic/annual and exit medical check-up to ensure their  
595 health and welfare.

596

### 597 **Storage of crop protection products**

598

599 **4.6.27** The crop protection product storage facility should comply with all the  
600 appropriate national or local regulations. It must have non-absorbent shelves such as  
601 metal or rigid plastic material to minimize the problem of contamination due to spillage.

602

603 **4.6.28** Chemicals should be stored in a well-lighted, sound and secure structure,  
604 with access limited to the authorized personnel only. The structure should be  
605 located and constructed to minimize the risk of contaminating produce and should be  
606 equipped with emergency facilities in the event of a chemical spill, fire and other natural  
607 or man-made calamities.

608

609 **4.6.29** Crop protection products should be stored in their original container with  
610 legible labels.

611

612 **4.6.30** Proper segregation in the storage of crop protection products should be  
613 observed.

614

### 615 **Maintenance and storage of equipment**

616

617 **4.6.31** Equipment used for chemical application should be maintained in good  
618 working condition. Such equipment should be checked by a technically competent  
619 person before each use.

620

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621 **4.6.32** Agricultural chemical sprayers should be calibrated as necessary, to maintain the  
622 precision of the application rate.

623  
624 **4.6.33** Mixing containers, sprayers and other equipment and tools used for chemical  
625 applications should be thoroughly washed after use, especially when used with  
626 different agricultural chemicals on different crops, i. e. to avoid contamination of the  
627 produce or damaging the crop. Washings should be contained for proper disposal.

628  
629 **4.6.34** Protective clothing should be separately washed from other clothings and  
630 stored properly for future use.

631  
632 **Disposal of crop protection products and other contaminated wastes**

633  
634 **4.6.35** Empty chemical containers should not be re-used and should be safely secured  
635 until these are disposed. Empty containers should never be used for food and drink-  
636 related purposes.

637  
638 **4.6.36** Empty chemical containers are disposed of according to relevant country  
639 regulations and in a manner that minimizes the risk of contaminating produce. Official  
640 collection and disposal systems are used where available.

641  
642 **4.6.37** Crop protection product containers should be rinsed three (3) times prior to  
643 disposal and should be disposed according to label directions.

644  
645 **4.6.38** Expired or banned chemical should never be used for crop protection purposes.  
646 Obsolete chemicals are disposed of through official collection systems or in legal off-  
647 site areas.

648  
649 **4.6.39** Tank washings should be disposed appropriately to avoid contamination of the  
650 produce and minimize the risk of environmental harm within and outside the site.

651  
652 **4.6.40** All pesticide-contaminated wastes shall be disposed in a designated sanitary  
653 landfill, if available.

654  
655 **4.6.41** Fuels, oils and other unusable non-agri-chemicals should be disposed  
656 properly to avoid the risk of contaminating the produce.

657  
658 **Environmental safety**

659  
660 **4.6.42** To prevent possible ecological imbalance, growers should use biological controls  
661 that are authorized for the cultivation of specific fruit or vegetable and should be used in  
662 accordance with the approved instructions for the intended purpose/s.

663  
664 **4.6.43** Farm activities comply with country regulations covering protected plant and  
665 animal species to ensure that protected species are not damaged.

666

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667 **4.6.44** To conserve native plant and animal species, access and activity is managed in  
668 significant remnant native vegetation areas, wildlife corridors, and vegetation areas on  
669 and near the banks of waterways.

670

671 **4.6.45** Measures are used to control feral animals and environmental pests.

672

673 **4.6.46** The generation of offensive odour, smoke, dust, and noise is managed to  
674 minimise the impact on neighbouring properties.

675

## 676 **4.7 Harvesting and handling produce From harvest to storage prior to transport**

677

### 678 **a. Harvesting**

679

680 **4.7.1** Practices that are critical to managing produce safety and quality during  
681 production, harvesting and postharvest handling are identified for the crop grown.

682

683 **4.7.2** Appropriate maturity indices should be the bases in determining the harvest time.

684

685 **4.7.3** Appropriate harvesting technique should be employed in harvesting to  
686 optimize the quality and other desired characteristics of produce during harvest or  
687 postharvest phases.

688 **4.7.4** Harvesting time should be done in accordance to commodity requirements.  
689 Harvesting under the rain should be avoided. Fresh fruits and vegetables that are unfit  
690 for human consumption should be segregated during harvesting. Those which cannot be  
691 made safe by further processing should be disposed properly to avoid contamination of  
692 the uncontaminated produce.

693

694 **4.7.5** Containers used for harvesting should be suitable and clean before use.  
695 Liners should be used to protect the produce, particularly when containers have  
696 rough surfaces.

697

698 **4.7.6** If the containers are recycled, these should be properly cleaned or discarded  
699 accordingly if found unfit for use.

700

701 **4.7.7** Harvested produce should not be placed in direct contact with the soil or floor in  
702 the handling, packing or storage areas.

703

### 704 **b. Packaging**

705

706 **4.7.8** Produce should be graded and packed according to market requirements.

707

708 **4.7.9** When packing of fresh fruits and vegetables is done in the field, contaminated  
709 containers or bins exposed to the sources of contaminants (i.e. manure) should be  
710 avoided.

711

## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

712 **4.7.10** Protective materials should be used whenever appropriate to protect the produce  
713 from rough surfaces of containers and exposure to sunlight leading to excessive  
714 moisture loss.

715

716 **c. Pre-transport**

717

718 **4.7.11** Harvested produce should be placed under shade or any covered area if  
719 transport is delayed.

720

721 **4.7.12** Any ice used for pre-cooling the produce and used at point of harvest must be  
722 made with potable water and handled under sanitary conditions to prevent produce  
723 contamination.

724

725 **4.7.13** After grading and classification, the produce should be packed in suitable  
726 containers. To minimize mechanical damage, packed containers should not be stacked  
727 on top of each other unless the containers are designed for stacking.

728

729 **4.7.14** If the harvested and packed produce stored on farm, storage areas must be  
730 clean and, if applicable, temperature and humidity controls are maintained.

731

732 **4.7.15** Produce that are packed and handled directly in the field, orchard or  
733 greenhouses must be removed from the field and transported to the processing area as  
734 quickly as possible in order to prevent post-harvest losses and contamination.

735

736 **4.8 Transport**

737

738 **4.8.1** All field-packed produce must be covered during transport in order to prevent  
739 contamination.

740

741 **4.8.2** Refrigerated transport vehicles should be covered with temperature settings that  
742 will minimize quality loss of the produce.

743

744 **4.8.3** Containers filled with produce are not placed in direct contact with soil where there  
745 is a significant risk of contaminating produce from soil on the bottom of containers.

746

747 **4.8.4** Pallets and transport vehicles should be checked before use for cleanliness,  
748 chemical spills, foreign objects and pest infestation. Pallets should be thoroughly  
749 cleaned and covered with protective material or rejected if there is a significant risk of  
750 contaminating produce. Transport vehicles should be cleaned if there is a significant risk  
751 of mechanical damage and contaminating produce.

752

753 **4.8.5** Produce should be transported separately from goods that are potential  
754 sources of chemical contamination and causes of biological and physical hazards.  
755 Moreover, mixing of non-compatible produce during transport should be avoided.

756

## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

757 **4.8.6** For long delays before transport, produce should be kept at the lowest  
758 possible temperature condition.

759  
760 **4.8.7** When farm vehicle used for transporting harvested produce are also used for other  
761 purposes, it should be cleaned prior to hauling to avoid contamination of the produce.

762  
763 **4.9 Specific process steps**

764  
765 **Post-harvest washing**

766  
767 **4.9.1** Whenever required, the produce should be treated with approved protocols to  
768 minimize disease development and loss of quality.

769  
770 **4.9.2** Water used for washing the produce should be analyzed at least annually.  
771 The levels of water quality parameters should be maintained within accepted WHO  
772 thresholds or are accepted as safe for the food industry by the competent authority.

773  
774 **4.9.3** The water to be used for final washing of the edible parts of produce should have  
775 quality equivalent to potable water standard, although clean water can be used for the  
776 initial washings.

777  
778 **4.9.4** Where appropriate, the temperature of the post-harvest water should be controlled  
779 and monitored. The temperature monitoring record is kept for traceability.

780  
781 **4.9.5** Ice to be used for cooling purposes should be made from potable water. The  
782 production, handling and storage of ice for postharvest purposes should follow  
783 appropriate safeguards to avoid contamination.

784  
785 **4.9.6** In the case that water is re-circulated or recycled for final washing of the produce,  
786 proper filtering and disinfection process should be done. The pH and microbial load  
787 should be routinely monitored. A routine cleaning schedule according to the usage  
788 should be maintained and documented.

789  
790 **4.9.7** Post-harvest systems that use water for washing the produce should be designed  
791 in a manner that minimizes product lodges and dirt build up.

792  
793 **Postharvest treatment**

794  
795 **4.9.8** Anti-microbial agents should only be used when absolutely necessary to minimize  
796 cross-contamination during postharvest and when used for good hygienic practices.  
797 The level of anti-microbial agents should be monitored and controlled. Washing of  
798 fruits and vegetables should be done to ensure that chemical residues do not exceed  
799 levels as recommended by the Codex Alimentarius Commission.

800  
801 **4.9.9** The farm should only use approved and registered materials for postharvest  
802 treatments such as waxes, pesticides to include fungicides, and GRAS (Generally

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803 Regarded as Safe) chemicals. Postharvest treatment materials should be carried out  
804 in accordance with label instructions.

805  
806 **4.9.10** Sprayers for postharvest treatments should be calibrated regularly to control the  
807 accuracy of the application rate. After use, sprayers should be thoroughly  
808 washed in safe areas, particularly when different chemicals are used to avoid  
809 contamination of the produce.

810  
811 **Cooling system of fresh fruits and vegetables**

812  
813 **4.9.11** When pre-cooling is required, it should be done in accordance to the  
814 requirements of specific fresh fruit(s) or vegetable(s). When appropriate, fresh fruits and  
815 vegetables should be maintained at low temperatures after pre-cooling to minimize  
816 microbial growth. The temperature of the cold storage should be controlled and  
817 monitored.

818  
819 **4.9.12** Condensate and defrost water from evaporator type cooling systems (e.g.  
820 vacuum cooling, cold rooms) should not drip onto fresh fruits and vegetables. The inner  
821 side of the cooling systems should always be clean.

822  
823 **4.9.13** Potable water should be used in cooling systems, particularly when water or ice  
824 is in direct contact with fresh fruits and vegetables (e.g. hydro-cooling, ice-  
825 cooling). The water quality in these systems should be controlled and maintained.

826  
827 **4.9.14** Forced-air cooling involves the use of rapid movement of refrigerated air over  
828 fresh fruits and vegetables in cold rooms. Air-cooling systems should be appropriately  
829 designed and maintained to preserve quality and to avoid contaminating the  
830 fresh produce.

831  
832 **4.10 Off-farm facility for produce handling and/or storage**

833  
834 **4.10.1** Floors should be designed with appropriate slopes, drainage channels and  
835 kept free and clear to ensure good drainage system.

836  
837 **4.10.2** Produce handling facilities and equipment such as process lines and  
838 machinery, floors, storage areas, pallets as well as floors and walls should be  
839 cleaned and/or maintained regularly to prevent contamination.

840  
841 **4.10.3** Rejected produce and waste material should be disposed properly in  
842 designated areas to prevent contamination of the produce.

843  
844 **4.10.4** Cleaning agents, lubricants, etc. should be kept in a designated area that is  
845 separate and apart from packing area to avoid chemical contamination of produce.

846  
847 **4.10.5** Domestic animals should not be allowed to enter processing facilities to  
848 prevent contamination of the produce.

849 **4.10.6** There must be monitoring and management systems for pest control to avoid or  
850 minimize pest infestation. Traps and baits should be identified in the building lay out  
851 map.

852

#### 853 **4.11 Personal hygiene and farm sanitation**

854

##### 855 **Personal Hygiene**

856

857 **4.11.1** Workers should have appropriate knowledge or must be trained in personal  
858 hygiene practices.

859

860 **4.11.2** Farm workers should comply with farm hygiene regulations such as  
861 observance of personal cleanliness and appropriate clothing (i.e. hand washing, wearing  
862 of jewelry and fingernail length and cleaning, etc) and personal behavior (i.e. no  
863 smoking, spitting, eating, chewing, etc).

864

865 **4.11.3** Written instructions on personal hygiene practices should be provided to  
866 workers or displayed on prominent locations.

867

868 **4.11.4** Fixed or mobile toilets and hand washing facilities should be available and  
869 accessible to the workers and should be properly maintained in good hygienic condition.  
870 These should be located in an appropriate area.

871

872 **4.11.5** Where employers are required to provide medical and health cover, any serious  
873 health issue is reported to the relevant health authority.

874

##### 875 **Farm Sanitation**

876

877 **4.11.6** Measures should be taken in order to ensure that the cultivation area is free from  
878 possible sources of contamination (e.g. litter, etc.).

879

880 **4.11.7** Packing, handling and storage areas that can be sources of contamination  
881 should be identified. Cleaning and sanitation procedures should be prepared and  
882 followed.

883

884 **4.11.8** Appropriate cleaning and sanitation chemicals are selected to minimise the risk of  
885 these chemicals causing contamination of produce.

886

##### 887 **Equipment, containers and materials**

888

889 **4.11.9** Containers used for harvesting, handling and packing produce must never be  
890 used for hauling or storing agricultural chemicals, lubricants, oil, cleaning chemicals,  
891 plant or other debris, tools, etc.

892

893 **4.11.10** Equipment, reusable harvesting containers, harvesting tools that comes in  
894 contact with fresh fruits and vegetables are made of non-toxic materials, easily cleaned

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895 and disinfected. These implements and the farm vehicle should be regularly maintained  
896 at least once a year.

897

898 **4.11.11** Equipment, containers and materials should be stored in a separate area away  
899 from chemicals, fertilizers and soil additives storage areas. Measures should be taken  
900 to minimize contamination from pests.

901

902 **4.11.12** Containers for waste, by-products and inedible or dangerous substances  
903 should be specifically identifiable, suitably constructed and, where appropriate, made of  
904 impervious material. Where applicable, such containers should be lockable to prevent  
905 malicious or accidental contamination of fresh fruits and vegetables or agricultural inputs.  
906 Such containers should be segregated and identified so that they will not be used as  
907 harvesting containers.

908

### 909 **Buildings and Structures**

910

911 **4.11.13** Building and structures used for production, packing, handling and storage of  
912 produce should be designed and constructed according to building standards and  
913 maintained to minimize the risk of contaminating the produce. Lights bulbs should be  
914 shatter proof in areas where produce, packing containers and materials are  
915 exposed. In the event of bulb shattering, exposed produce is rejected while equipment,  
916 packing containers and materials are cleaned.

917

918 **4.11.14** There should be a separate designated packing area, where the produce are  
919 handled and prepared to prevent cross-contamination.

920

921 **4.11.15** Sewage, waste disposal and drainage systems are constructed to minimize the  
922 risk of contaminating the production site and water supply.

923

### 924 **Animals, Pest and Disease Control**

925

926 **4.11.16** Except for fruit bearing trees, domestic and farm animals must be restricted from  
927 the production site and from areas where produce are harvested, packed and  
928 temporarily held.

929

930 **4.11.17** Measures should be taken to prevent the introduction of pests and diseases  
931 within the cultivation, handling, packing and storage areas.

932

933 **4.11.18** Baits and traps used for pest control should be positioned and maintained in  
934 strategic areas to minimize the risk of contaminating the produce, packing containers  
935 and other handling materials. The location of baits and traps should be included in the  
936 building lay out map.

937

938

939

940

941 **4.12 Worker's health, safety and welfare**

942

943 **Training**

944

945 **4.12.1** Employers and workers must have appropriate knowledge or must have  
946 proper training on their areas of responsibility that are relevant to good agricultural  
947 practice.

948

949 **4.12.2** Based on the area of responsibility of the workers, appropriate knowledge or  
950 training should be available on the following areas:

951

- 952 • vehicles, equipment and tool operation;
- 953 • accident and emergency procedures;
- 954 • safe use of chemicals;
- 955 • personal hygiene; and
- 956 • proper handling of produce.

957

958 **4.12.3** Personnel working in packing houses should be able to practice good  
959 handling practices and Good Hygienic Practices (GHP); and aware of their role and  
960 responsibility in protecting fresh fruits and vegetables from contamination and  
961 deterioration. Packers should have the necessary knowledge and skills to enable  
962 them to perform packing operations and to handle fresh fruits and vegetables in a  
963 way that the potential for microbial, chemical and physical contamination are minimized.

964

965 **4.12.4** There are documented, understandable and verbally communicated  
966 instructions made to the workers enabling them to know how to act in accident and  
967 emergency situations. These instructions should be available in the predominant  
968 languages of the workforce and should be displayed in conspicuous places.

969

970 **4.12.5** Safe manual handling practices are followed to minimise the risk of injury from  
971 lifting heavy objects and excessive twisting and reaching movements.

972

973 **4.12.6** New workers should be informed about the risks associated with health and  
974 safety when starting at the worksite.

975

976 **Worker welfare**

977

978 **4.12.7** In case living quarters are provided by an employer, the structure must be  
979 suitable for human habitation and contain basic services and facilities.

980

981 **4.12.8** The farm should employ workers at least 18 years old.

982

983 **4.13 Waste management and energy efficiency**

984

985 **4.13.1** A farm should have an operational waste management plan and should be  
986 properly followed.

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987  
988 **4.13.2** Consumption of electricity and fuel should be monitored and reviewed for  
989 efficient and optimized operation in which power and fuel bills may be of assistance.  
990

991 **4.13.3** Machinery and equipment should be serviced to maintain operational  
992 efficiency.  
993

994 **4.14 Traceability and recall**  
995

996 **4.14.1** Records of production, processing and distribution should be maintained for two  
997 (2) years to facilitate a food borne illness investigation and recall, if any.  
998

999 **4.14.2** Growers and/or packers should always update all relevant information on  
1000 agricultural activities such as the site of production, suppliers' information on agricultural  
1001 inputs, lot numbers of agricultural inputs, irrigation practices, use of agricultural  
1002 chemicals, water quality data, pest control and cleaning schedules for indoor  
1003 establishments, premises, facilities, equipment and containers.  
1004

1005 **4.14.3** A record should also be kept on the following specifics: date of supply,  
1006 quantity of produce and destination for each consignment of produce.  
1007

1008 **4.14.4** Growers and packers should have programs to ensure effective lot  
1009 identification. These programs should be able to trace the sites and agricultural inputs  
1010 involved in primary production and the origin of incoming material at the packing  
1011 establishment in case of suspected contamination.  
1012

1013 **4.14.5** Packed containers must be clearly labeled with an identification to enable  
1014 traceability of the produce to the farm or site where the produce is grown.  
1015

1016 **4.14.6** When produce is identified as being contaminated or potentially contaminated, the  
1017 produce is isolated and distribution prevented or if sold, the buyer is immediately notified.  
1018

1019 **4.14.7** The cause of any contamination is investigated and corrective actions are taken  
1020 to prevent re-occurrence and a record is kept of the incident and actions taken.  
1021

1022 **4.15 Documentation and Records**  
1023

1024 **Site history and management**  
1025

1026 **4.15.1** In case of new sites, a record should be kept for all potential hazards identified  
1027 during the assessment. Whenever remedial action is required to manage the risk, a  
1028 record should be kept on the action taken and the results thereof.  
1029

1030 **4.15.2** In case of multiple production areas in a site, the name or code of each  
1031 production area should be indicated in all documents and recorded.

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1032 **Planting material**

1033  
1034 **4.15.3** Whenever a planting material is produced within the farm or from non- accredited  
1035 farm sources, chemical used for treatment and purpose of the treatment should be  
1036 documented.

1037  
1038 **4.15.4** In case planting materials are procured from accredited nurseries or seed  
1039 producer, the name and specifics of the cultivar, the name of the supplier, and the date  
1040 of procurement should be record.

1041  
1042 **Fertilizers and soil additives**

1043  
1044 **4.15.5** A record of fertilizers and soil additives obtained should be kept with the  
1045 following specifics: source, product name, and date and quantity obtained.

1046  
1047 **4.15.6** The application of fertilizers and soil additives, chemical fumigants and  
1048 alternatives to sterilise soils and substrates should be recorded, detailing the following:  
1049 date, name of the product or material used, treatment location, application rate,  
1050 application method, and operator name.

1051  
1052 **4.15.7** Records of procurement, inventory and utilization of inorganic fertilizers  
1053 should be maintained and updated regularly. These should include: source, product  
1054 name, date and quantity, expiration date (for liquid fertilizers) and the nutrient  
1055 composition of the materials.

1056  
1057 **4.15.8** Treatment of organic fertilizer materials prior to application should be  
1058 documented. The method, date and duration of the treatment should be recorded. The  
1059 level of pathogen reduction (*E.coli* and *Salmonella* should be zero) achieved by different  
1060 treatments should be documented and supported by laboratory analyses.

1061  
1062 **4.15.9** The farm should maintain a documented maintenance program for the equipment  
1063 used for the application of fertilizers and soil additives.

1064  
1065 **Water**

1066  
1067 **4.15.10** A documentation should be kept for any occurrence of significant hazards  
1068 during the assessment of source of irrigation water. If contamination occurs, corrective  
1069 actions should be carried out and actions taken should be properly documented.

1070  
1071 **4.15.11** Where available, a record of the water testing results should be kept.

1072  
1073 **4.15.12** If water treatment is done, a record of the treatment method/s used and the  
1074 monitoring results should be kept.

1075

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1076 **4.15.13** A record is kept of irrigation use, detailing crop, date, location, volume of  
1077 water applied or duration of irrigation, unit area, and name of person who managed the  
1078 irrigation activity.

1079

1080 **Crop protection**

1081

1082 **4.15.14** A record of procured chemicals should be kept, with the following details:  
1083 chemical name, supplier of the chemical, date of purchase, expiry dates, and  
1084 quantity procured.

1085

1086 **4.15.15** After application, the following should be recorded: name of applicator, name of  
1087 product/s used, application rate, frequency of application, method of application, date of  
1088 application and PHI.

1089

1090 **4.15.16** If chemical residues in excess of the MRL are detected, the cause of the  
1091 contamination is investigated, corrective actions are taken to prevent re-occurrence, and  
1092 a record is kept of the incident and actions taken.

1093 **4.15.17** In order to avoid expired chemicals, a record or inventory of stored chemicals  
1094 should be kept with the following details: chemical name, date and quantity obtained,  
1095 expiry date and date when completely used or disposed of.

1096

1097 **4.15.18** Records of maintenance and calibration activities for agricultural chemical  
1098 sprayers should be kept.

1099

1100 **4.15.19** The records must always be accessible during inspection of the farm.

1101

1102 **Harvest and Postharvest treatment**

1103

1104 **4.15.20** If applicable, farm storage areas temperature and humidity are recorded.

1105

1106 **4.15.21** Application of postharvest agrichemical should be recorded and maintained  
1107 with the following information:

1108

- 1109 • produce identity (i.e. lot or batch of produce)
- 1110 • location of application
- 1111 • application dates
- 1112 • pest or disease treated (common name)
- 1113 • type of treatment
- 1114 • product trade name/formulation
- 1115 • product quantity applied
- 1116 • operator's name

1117

1118 **4.15.22** Documented records should be kept for the cleaning and maintenance of  
1119 produce handling facilities and equipment.

1120

## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

**1121 Animals, Pest and Disease Control**

1122

1123 **4.15.23** Actions taken for animal, pest and disease control and monitoring must be  
1124 recorded.

1125

**1126 Workers' health, safety and welfare**

1127

1128 **4.15.24** A record of personnel orientation training on personal hygiene practices, risks  
1129 associated with and health safety, and programs relevant to good agricultural practices  
1130 should be kept.

1131

1132 **4.15.25** Records should indicate that the required instructions or training program are in  
1133 place and copies of attendance certificates or a signed list of workers who  
1134 attended the training course(s) must be compiled.

1135

**1136 Waste management**

1137

1138 **4.15.26** Disposal of rejected produce and waste materials should have documented  
1139 records.

1140

1141 **4.15.27** Farm waste management plan should be properly documented including the:  
1142 types of waste products generated by property activities, practices to minimize waste  
1143 generation, reuse or recycling of waste, and storage and disposal of waste.

1144

1145 **4.15.28** Out of date documents are disposed and only current versions of documents  
1146 relevant to good agricultural practice are used.

1147

1148 **4.15.29** Written and/or documentary accounts should be kept which enables the official  
1149 or officially recognized certification body/authority to trace the origin, nature and quantities  
1150 of all raw materials bought and the use of such materials. In addition, written and/or  
1151 documentary account should be kept of the nature, quantities, and consignees of all  
1152 agricultural products sold. Quantities sold directly to the final consumers should  
1153 preferably accounted on a daily basis.

1154

**1155 4.16 Internal self-Inspection**

1156

1157 **4.16.1** The grower should conduct a documented annual internal self-inspection.  
1158 Effective corrective actions should be implemented if necessary.

1159

1160

1161

1162

1163

1164

1165

1166

## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

1167 **References**

1168

1169 The following referenced documents are indispensable for the application of this  
1170 document. For undated references, the latest edition of the referenced document  
1171 (including any amendments) applies.

1172

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## Code of Good Agricultural Practices (GAP) for Fruits and Vegetables Farming

1213	<b>Technical Working Group for the Revision of Philippine</b>	
1214	<b>Code of Good Agricultural Practices (GAP) for Fruits and Vegetable Farming</b>	
1215		
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