Good Agricultural Practice (GAP) - Crop commodities (Second revision)

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Committee representation

The Industry Standards Committee on Agriculture (ISC A) under whose authority this Malaysian Standard was developed, comprises representatives from the following organisations:

- Department of Agriculture Malaysia
- Department of Agriculture Sabah
- Department of Agriculture Sarawak
- Department of Fisheries Malaysia
- Department of Standards Malaysia
- Department of Veterinary Services
- Farmers' Organisation Authority
- Federal Agricultural Marketing Authority
- Federation of Livestock Farmers’ Associations of Malaysia
- Forest Research Institute Malaysia
- Malaysia Fruit Exporters Association
- Malaysian Agricultural Research and Development Institute
- Malaysian Association of Standards Users
- Ministry of Agriculture and Agro-Based Industry Malaysia
- Ministry of Domestic Trade, Co-operatives and Consumerism
- Ministry of Health Malaysia
- Ministry of Plantation Industries and Commodities
- National Farmers Organisation
- National Seed Association Malaysia
- SIRIM Berhad (Secretariat)
- The Federation of Vegetables Growers’ Associations Malaysia
- Universiti Putra Malaysia

The Technical Committee on Good Agricultural Practice for Crop Commodities which developed this Malaysian Standard consists of representatives from the following organisations:

- Department of Agriculture Malaysia
- Department of Agriculture Sabah
- Department of Agriculture Sarawak
- Federal Agricultural Marketing Authority
- Forest Research Institute Malaysia
- Malaysian Cocoa Board
- Malaysian Palm Oil Board
- Malaysian Pepper Board
- Malaysian Rubber Board
- Ministry of Health Malaysia
- National Association of Smallholders Malaysia
- QA Consulting Resources
- Sime Darby Research Sdn Bhd
- SIRIM Berhad (Secretariat)
- Universiti Putra Malaysia
Foreword

This Malaysian Standard was developed by the Technical Committee on Good Agricultural Practice for Crop Commodities under the authority of the Industry Standards Committee on Agriculture.

Major modifications in this revision are as follows:

a) exclusion of rubber and oil palm production in the scope;

b) update on Clause 2, Normative references;

c) inclusion of new terms and definitions for pests, pesticide and planting materials;

d) inclusion of requirements on choice of planting materials or rootstock;

e) “irrigation and fertigation” has been changed to “water management”;

f) inclusion of recommendation for rain water harvest;

g) inclusion of reference to MS 479 for handling and use of personal protective equipment (PPE);

h) inclusion of inventory record for pesticide storage;

i) inclusion of reference to MS 2302 for packaging of produce; and

j) inclusion of new clause on recall/withdrawal procedure.

This Malaysian Standard cancels and replaces:

MS 1784: Part 1:2015, Crop Commodities - Good Agricultural Practice (GAP) - General (First revision)
MS 1784: Part 4:2005, Crop Commodities - Good Agricultural Practice (GAP) - Cocoa
MS 1784: Part 5:2005, Crop Commodities - Good Agricultural Practice (GAP) - Pepper (Piper nigrum .)
MS 1784: Part 6:2007, Crop Commodities - Good Agricultural Practice (GAP) - Flowers and ornamentals
MS 1784: Part 7:2007, Crop Commodities - Good Agricultural Practice (GAP) - Fruits and vegetables
MS 1784: Part 8:2009, Crop Commodities - Good Agricultural Practice (GAP) - Herbs

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.
Good Agricultural Practice (GAP) - Crop commodities

1 Scope

This Malaysian Standard prescribes a generic code of practice that defines essential elements for agricultural producers to adopt Good Agricultural Practice (GAP) for sustainable crop production that is legally compliant, environmentally sound, socially acceptable and economically viable to ensure quality produce that is safe and suitable for consumption and/or utilisation.

This standard is not applicable to rubber and oil palm production.

2 Normative references

The following normative references are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the normative reference (including any amendments) applies.

- Environmental Quality Act 1974 and Environmental Quality Regulations 1979
- Food Act 1983 and Food Regulations 1985
- Occupational Safety and Health Act 1994
- Protection of New Plant Variety Act 2004
- Pesticide Act 1974
- Guidelines for the Implementation of the ASEAN Policy on Zero Burning

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1 crop producers

Entities involved in commercial production of crops including individuals and companies.

3.2 economically viable production

Production that gives positive returns on a sustainable basis.

3.3 environmentally sound

Farm practices that do not have adverse effects on the environment, e.g. chemical pollution of water ways, effluent discharge, air pollution, biodiversity loss.
3.4 integrated pest management (IPM)

An ecosystem approach to crop production and protection that combines different management strategies and practices to grow healthy crops and minimise the use of pesticides.

[Definition adapted from FAO 2002 [15]]

3.5 legally compliant

Adherence to all existing written national and local laws and legislations.

3.6 pests

Any species, strain or biotype of plant, animal or pathogenic agent that cause injury and reduce the quality of crop and produce.

EXAMPLE Insects, other invertebrates, fungi, bacteria, viruses, weeds and vertebrates.

3.7 pesticide

Any substance that contains an active ingredient; or any preparation, mixture or material that contains any one or more of the active ingredients as one of its constituents intended for preventing, destroying or controlling any pests.

3.8 planting materials

Seeds, seedlings, cuttings, bulbs, corms, plantlets, suckers, budded -plants, rhizomes, shoots, ramets, tissue culture and any other parts of plant used for planting.

3.9 quality produce

Produce that is wholesome and safe for consumption and/or suitable for utilisation.

3.10 socially acceptable

FINAL Meeting the requirements on the welfare, safety and health of persons working or living in the farm and end consumers utilising the produce.

3.11 sustainable crop production

A holistic, systems-oriented approach to farming that is efficient in resource management and focuses on the interrelationship of social, economic and environmental processes. This approach ensures efficient production of safe and high quality agricultural products.

3.12 traceability

The ability to follow the trace of produce through one step or multiple steps of operations at all levels.
4 Requirements

4.1 Traceability

The produce shall be traceable to the farm where it has been originally produced.

4.2 Record keeping and auditing

4.2.1 Record keeping

The producer shall maintain records for at least six months prior to the date of inspection or from the date of registration and kept up-to-date for a minimum of two years unless stipulated by any specific legislation. Record keeping system shall be established in which all the essential elements are captured. The records shall be accessible and audited. All farm records shall be treated as confidential.

4.2.2 Auditing

Auditing shall be carried out at least once a year by the competent authorities. It shall be completed and documented. Corrective actions shall be implemented and documented.

4.3 Site history and site management

4.3.1 Site history

4.3.1.1 A recording system shall be established for the site history and the layout of fields of their crop history.

4.3.1.2 Where applicable, for all new agricultural sites, a risk assessment shall be carried out, taking the following into account:

a) prior use of the land;

b) potential impacts of the production on adjacent crops and areas; and

c) potential impact of activities carried out at adjacent areas.

The information of the risk assessment shall be recorded.

4.3.1.3 Farms should not be located more than 1 000 m above sea level unless comply with all necessary regulatory approvals.

4.3.1.4 Farms should not be located on steep slopes which may be detrimental to the environment.

4.3.2 Site management

4.3.2.1 The farm management shall demonstrate that it has legal rights to the cultivation of the land and all necessary regulatory approvals.

4.3.2.2 Where farms are located on sloping land (within the permissible level), appropriate soil conservation measures shall be undertaken to prevent soil erosion and silt deposition into drains, waterways, etc.
4.3.2.3 A visual identification or reference system for each field shall be established.

4.4 Planting materials and rootstocks

4.4.1 Choice of planting materials or rootstocks should meet requirements as agreed between crop producers and customers (e.g. visual appearance, shelf-life, agronomic performance, environmental impact and minimal dependence on agrochemicals).

4.4.2 Quality planting materials shall be used and produced in accordance to any relevant legislation and/or national standards of planting material. A record such as variety name, variety purity, viability, batch number and planting materials vendor shall be kept. Where available, planting materials certification records shall be retained.

4.4.3 The use of genetically modified planting materials shall be avoided unless expressed permission has been given by the relevant authorities and shall comply with existing regulations in the country of the final consumers.

4.4.4 Where protected varieties are used, the farm shall comply with Protection of New Plant Variety Act 2004.

4.4.5 Varieties used for planting in the farm should preferably possess resistance or tolerance to major pests and diseases, so as to minimise utilisation of pesticide.

4.4.6 If planting materials treatment are carried out, the use of these treatments shall be justified and shall be recorded. The method and the chemical used shall be in accordance to legislation currently in force in the country.

4.5 Soil and substrate management

4.5.1 Soil mapping

Soil and topography map of the farm should be available for planning and planting programmes.

4.5.2 Cultivation

Cultivation practices proven to improve or maintain soil structure and to avoid soil compaction should be followed.

4.5.3 Soil erosion

Field cultivation techniques that minimise soil erosion shall be adopted.

4.5.4 Soil treatment

If soil treatment is needed to control soil-borne pest and diseases, alternative methods shall be explored before resorting to use of chemical treatment. Where chemical treatment of soils is carried out, it shall be justified and recorded.

4.5.5 Substrates

4.5.5.1 Preference should be given to the use of biodegradable substrates. Crop producers are encouraged to participate in substrate recycling programmes.
4.5.5.2 Where chemicals are used to sterilise substrates, records of location, date of application, type of chemical used and name of operator shall be kept. Steaming should be the preferred treatment of sterilisation.

4.6 Fertiliser management

4.6.1 nutrient requirement

4.6.1.1 To ensure nutrient balance and minimise nutrient loss, a proper soil and crop management practices should be adopted to suit the soil types.

4.6.1.2 The application of fertilisers should be based on nutrient levels of the soil or substrates and requirements of the crop.

4.6.2 Fertiliser utilisation

4.6.2.1 Usage of fertilisers should be in accordance with science based recommendations or best developed practice.

4.6.2.2 The type, quantity, method, timing and frequency of fertiliser application should be carefully observed so as to maximise benefits and minimise losses.

4.6.3 Records of application

All applications of fertilisers shall be recorded. Records shall include the following:

a) location (block);

b) date of application;

c) fertiliser supplier;

d) type and quantity of fertiliser applied;

e) method of application; and

f) name of operator.

4.6.4 Application machinery and equipment

Fertiliser application machinery and equipment should be kept in good working condition and calibrated.

4.6.5 Fertiliser storage

4.6.5.1 Fertiliser inventory shall be kept up-to-date and made available.

4.6.5.2 Fertilisers shall be stored on raised platform in a covered, clean, dry and well ventilated location where there is no risk of contamination of water sources. For organic fertiliser, it should be stored in an appropriate manner to reduce the risk of contamination of the environment.
4.6.5.3 The fertilisers shall not be stored together with:

a) planting materials;

b) fresh produce; and

c) pesticides unless physically separated and labelled accordingly, preferably in separate rooms.

4.6.5.4 All hazards and risks to human shall be clearly indicated.

4.6.5.5 The use of untreated and treated human sewage sludge and pig waste are prohibited.

4.7 Water management

4.7.1 Water management should be based on crop requirement.

4.7.2 Water should be derived from unpolluted sustainable sources. Where necessary, crop producers may seek advice from relevant authorities on water sourcing.

4.7.3 Based on risk assessments, water sources should be analysed for microbial, chemical and mineral pollutants. The analysis results should comply with the *Environmental Quality Act 1974* and *Environmental Quality Regulations 1979* and adverse results acted upon.

4.7.4 Use of untreated sewage water is prohibited.

4.7.5 All crop producers are encouraged to maintain records of water usage.

4.7.6 Rain water harvest is encouraged where it is practically feasible, e.g. from building roofs, glasshouses, etc.

4.8 Crop protection

4.8.1 Basic elements of crop protection, choice of chemical and advice on usage of chemicals

4.8.1.1 Crop producers shall adopt appropriate IPM techniques. Crop producers are encouraged to seek advice on IPM from competent authorities.

4.8.1.2 The use of pesticides to protect the crop shall be minimised. When pesticides are used, it shall be registered under the *Pesticide Act 1974*. Details handling and use of pesticides can be referred in MS 479.

4.8.1.3 Selective pesticides that are specific to the target pest and appropriate crops which have minimal effect on populations of beneficial organisms, aquatic life, workers and consumers should be used.

4.8.1.4 Instructions on the label shall be followed to ensure effective application and to avoid risks to operators, consumers and the environment.

4.8.1.5 For crops to be exported, producers shall use pesticides that are allowed in importing countries.
4.8.1.6 Crop producers should consult their customers to determine if any additional commercial restrictions exist.

4.8.1.7 Crop producers are encouraged to seek advice on pesticide usage from competent authorities.

4.8.1.8 The producer shall take active measures to avoid the risk of pesticide drift from own plots to neighbouring production areas. This may include, but not limited to, knowledge of what the neighbours are growing, maintenance of spray equipment, etc.

4.8.2 Records of application

The required quantity and concentration of pesticide to be used for the crop to be treated shall be calculated. Records of pesticide application shall include the following:

a) date of application;

b) crop name;

c) location (block) and hectarage;

d) trade name and active ingredients;

e) justification for application;

f) dosage;

g) spray equipment used;

h) name of operator; and

i) pre-harvest and re-entry interval.

4.8.3 Safety, training and instructions

4.8.3.1 Operators shall be trained on safe and proper use of pesticides.

4.8.3.2 Each area of application should be marked with appropriate warning sign.

4.8.4 Personal protective equipment (PPE)

4.8.4.1 Operators shall be equipped with suitable PPE appropriate to the danger posed to health and safety.

4.8.4.2 PPE shall be cleaned after use and stored separately from pesticides.

4.8.4.3 Details handling and use of PPE can be referred in MS 479.

4.8.5 Pre-harvest interval

Pre-harvest intervals as prescribed on pesticide labels shall be strictly adhered to.
4.8.6 Spray equipment

4.8.6.1 Suitable spray equipment shall be used on crop and farm and in good working condition.

4.8.6.2 Calibration should be carried out to ensure accurate delivery of the required quantity of spray.

4.8.6.3 Water from the cleaning of the equipment should be sprayed over on designated fallow land. Records of such spraying should be kept.

4.8.7 Pesticide storage

4.8.7.1 Pesticides shall be stored in accordance with the relevant regulations.

4.8.7.2 All pesticides shall be stored in their original package.

4.8.7.3 Only chemicals registered for use on crops on the farm shall be stored.

4.8.7.4 Pesticides shall be stored in a sound, secured, water resistant, well ventilated, well-lit location and physically separated from other materials.

4.8.7.5 The pesticide store shall be able to retain spillage.

4.8.7.6 All shelving should be of non-absorbent material.

4.8.7.7 Powders shall be stored on shelves above liquids, or separately.

4.8.7.8 There shall be adequate facilities for measuring and mixing pesticides.

4.8.7.9 Keys and access to the store shall be limited to workers with adequate training in handling of pesticides.

4.8.7.10 Warning signs of potential dangers shall be placed on access doors.

4.8.7.11 There shall be emergency facilities to deal with contamination and accidental spillage.

4.8.7.12 A procedure to handle accidents shall be available with a list of contact telephone numbers and the location of the nearest telephone within the immediate vicinity of the store.

4.8.7.13 Inventory shall be kept, updated and readily available. Inventory record shall include the following:

a) date of purchase;

b) trade name of pesticide;

c) active ingredients;

d) pesticide board registration number (LRMP No.);
e) quantity of pesticide;
f) pesticide supplier; and
g) price.

4.8.8 Empty pesticide containers

4.8.8.1 Disposal or destruction of containers shall comply with Environmental Quality Act 1974 and Environmental Quality Regulations 1979 and/or any other relevant local regulations.

4.8.8.2 Empty containers shall be rinsed at least three times with water, and the washings returned to the spray tank. Rinsed containers shall be pierced to prevent re-use, unless the producer is participating in established recycling programmes, or with expressed permission from the authorities. Empty containers shall be kept secure until disposal is possible.

4.8.8.3 Designated collection centre and disposal systems should be utilised if available.

4.8.9 Obsolete and expired pesticides

Obsolete and expired pesticides shall only be disposed through a contractor approved by the relevant authority.

4.9 Harvesting

4.9.1 Produce should be harvested at the right marketable stage.

4.9.2 The workers shall be trained on the capability in selecting good quality produce that is free from soil, pests and other contaminants.

4.9.3 Damaged and disease infected produce shall be removed and destroyed.

4.9.4 Appropriate method should be used for harvesting.

4.9.5 Appropriate equipment and reusable crates shall be cleaned to ensure that they are free from pests and foreign materials which may be detrimental to the produce.

4.9.6 When produce is field packed, packaging shall not be left in the field overnight where risk of contamination exists.

4.9.7 The requirement for hygiene procedures shall be adopted by workers.

4.9.7.1 Written instruction on hygiene practices should be provided to workers and displayed on prominent locations.

4.9.7.2 Workers shall have access to clean toilet and washing facilities in the vicinity of their work place.

4.9.7.3 Workers shall notify the management should they contract any transferable diseases and/or unfit to work in the vicinity of produce.
4.10 Post harvest handling

4.10.1 Post harvest treatment

4.10.1.1 Use of chemical post harvest treatments should be minimised. When used, it shall be in accordance with product label or established recommendations.

4.10.1.2 When chemicals are used, they shall comply with Food Act 1983 and Food Regulations 1985. When pesticides are involved, they shall be registered under the Pesticide Act 1974.

4.10.1.3 For crops to be exported, crop producers shall use chemicals that are allowed in importing countries.

4.10.1.4 Crop producers should consult their customers to determine if any additional commercial restrictions exist.

4.10.1.5 Crop producers should be able to demonstrate their competence and knowledge with regard to the post harvest treatment.

4.10.1.6 Records for all post harvest treatments shall include the following:

a) crop name;

b) location;

c) date of treatment;

d) justification of treatment;

e) type of treatment;

f) active ingredients, concentration and/or dosage;

g) exposure time; and

h) name of operator.

4.10.2 Post harvest washing

4.10.2.1 Potable water shall be used for washing of produce.

4.10.2.2 Based on risk assessments, source of water for post harvest washing should be analysed for microbial, chemical and mineral pollutants.

4.11 Packaging

4.11.1 All permanent product packing and storage sites shall have adequate pest control measures, particularly in areas for produce handling, storage of packaging, storage of pesticides and storage of fertilisers.

4.11.2 Packaging materials shall be stored to avoid contamination by physical and chemical hazards, as well as pests.
4.11.3 Packing house, storage sites and packaging materials shall be protected from insects, rodents, birds and other animals.

4.11.4 Details packaging of produce can be referred in MS 2302.

4.12 Pesticide residue analysis of produce

4.12.1 The pesticide residue analysis shall be conducted, except for ornamental crop.

4.12.2 The laboratory shall be accredited.

4.12.3 Crop producers shall provide results of pesticide residue test.

4.12.4 The test results should be traceable to the crop producer and to the production site.

4.12.5 In the event of maximum pesticide residue level (MRL) is exceeded, corrective action shall be in place.

4.13 Waste and pollution management

4.13.1 All possible waste products and sources of pollution should be identified in the farm and its surrounding areas.

4.13.2 Waste and pollutants management should be developed and implemented to avoid or reduce wastage and pollution. Crop debris may be composted and re-cycled for soil conditioning. Landfilling or burning shall be avoided.

4.13.3 Storage structure for pesticides, fertilisers and other agrochemicals shall not be located adjacent to water source.

4.14 Workers welfare

4.14.1 All employment requirements shall comply with national and local labour law, and where appropriate, relevant International Labour Organization (ILO) conventions.

4.14.2 Workers directly involved in the farm shall be in good health conditions and receive basic training in hygiene requirements. Record of training shall be kept.

4.14.3 Safe farm work conditions shall be ensured at all times in line with the *Occupational Safety and Health Act 1994* and ILO conventions to ensure safe and healthy working conditions.

4.14.4 First aid boxes shall be available at permanent sites on the farm.

4.14.5 Hazards shall be clearly identified by warning signs where appropriate.

4.14.6 Accident and emergency procedures shall be made available with clear instruction to all workers and displayed appropriately.

4.14.7 Crop producer shall provide basic amenities for on-site living in compliance with national and local law.
4.15 Environmental issues

4.15.1 Impact of farming on the environment

Crop producers shall comply with Environmental Quality Act 1974, Guidelines for the Implementation of the ASEAN Policy on Zero Burning, or other comparable state legislations. In exceptional cases where fire has to be used for preparing land for planting, there shall be evidence of prior approval of the controlled burning.

4.15.2 Wildlife and biodiversity conservation

Crop producers should be conscious of the need to conserve wildlife and biodiversity which include the following.

a) Conservation organisations may be requested to conduct surveys to measure biodiversity and identify areas of concern.

b) Action should be taken to avoid damage and deterioration of habitats.

c) Crop producers are encouraged to convert unproductive sites such as swamps, steepslopes and deep peat, into conservation areas for natural flora and fauna.

4.16 Record of complaints

Records of complaints on non-compliance with requirements of this standard shall be kept and corrective actions shall be taken.

4.17 Recall/withdrawal procedure

The producers shall establish, document and maintain the procedure to manage/initiate the recall/ withdrawal of certified produce from the marketplace.

5 Legal requirements

All farm activities and produce shall in all other aspects comply with the requirements of the legislations currently in force in Malaysia.
Bibliography

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[4] MS 1529, Plant-based organically produced foods - Requirements for production, processing, handling, labelling and marketing
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[8] MS ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories
[10] Malaysian Good Agricultural practices (MyGAP), 2013
[15] ISPM 35, Systems approach for pest risk management of fruit flies (Tephritidae)
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Acknowledgements

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