



THAI AGRICULTURAL STANDARD

TAS 2501-2005

GOOD AGRICULTURAL PRACTICES FOR OKRA

National Bureau of Agricultural Commodity and Food Standards

Ministry of Agriculture and Cooperatives

ICS 65.020.20

ISBN 978-974-403-545-5

UNOFFICIAL TRANSLATION



THAI AGRICULTURAL STANDARD

TACFS 2501-2005

GOOD AGRICULTURAL PRACTICES FOR OKRA

National Bureau of Agricultural Commodity and Food Standards

Ministry of Agriculture and Cooperatives

50 Phaholyothin Road, Ladyao, Chatuchak, Bangkok 10900

Telephone (662) 561 2277 www.acfs.go.th

**Published in the Royal Gazette Vol.122 Special Section 117D,
dated 20 October B.E.2548**

Ad hoc Sub-Committee on the Elaboration of Standards for Good Agricultural Practices for Asparagus, Peppers, Okra

1. Chairperson of the Ad hoc Sub-Committee
Mr.Manoch Thongjiem (Senior Expert in Crop Production)
2. Representative of the Department of Department of Agriculture
Mrs.Piyarat Keinmeesuke
Ms.Arune Wongkobra
Mr.Korbkiati Bansiddhi
Ms.Orapan Wisetsung
3. Representative of the Department of Department of Agricultural Extension
Mr.Olan Pituck
Mrs.Orasa Dissataporn
4. Representative of the Department of Export Promotion
Mr.Nitsana Taweepanitch
5. Representative of the Department of Cooperative Promotion
Mrs.Watcharee Klinsorn
Mr.Ittipon Toros
6. Representative of the Office of Commodity and System Standards,
National Bureau of Agricultural Commodity and Food Standards
Ms.Metanee Sukontarug
Mrs.Oratai Silapanaporn
Mr.Pisan Pongsapitch
7. Representative of the Faculty of Agriculture, Kasetsart University
Assistant Professor Sutevee Sukprakarn
Mrs.Sirikul Wasee
8. Representative of the Faculty of Agriculture, Khon Kaen University
Assistant Professor Suchila Techawongstien
9. Experts
Mrs.Oranut Kongkanchana Expert of the Pest
Mrs.Ladda Tanalai Representative of the Swift Company Limited
Mr.Somkiat Sunthornpaisan Representative of the Production Sector
10. Representative of the National Bureau of Agricultural Commodity and Food Standards
Ms.Tassanee Pradyabumrung Secretary
Ms.Monticha Sanpa-Asa Assistant Secretary

Okra is an economically important vegetable crop of Thailand. Farmers are able to produce it for domestic and export demand. In order to provide the production of okra of Thailand with better acceptance by both national and international levels in term of food safety security for domestic and overseas consumers. The Ministry of Agriculture and Cooperatives deems it proper to establish a Good Agriculture Practices Standard for Okra.

The provisions of this standard are based upon the information of the following documents:

The Dept. of Agriculture. B.E. 2545 . Good Agriculture Practices for Okra. Agricultural Cooperatives Assembly Printing House of Thailand, Bangkok. 22 pp.

The National Bureau of Agricultural Commodity and Food Standards. B.E. 2546 . Thai Agricultural Standard, TAS 9001-2546. Good Agricultural Practices for Food Crops. Announced in Government Gazette Ratchakichanubecksa : General Notice, Volume 120, special section 145D. December 19, BE. 2546.

FAO/WHO. 2003. Code of Hygienic Practice for Fresh Fruits and Vegetables (ALINORM 03/13, Appendix II) adopted by the 26th Session of the Codex Alimentarius Commission (CAC).

Report of the 26th Session of the CAC, Rome, 30 June-7 July 2003.

EUREPGAP. 2004. EUREPGAP Control Points & Compliance Criteria Fruit and Vegetables Version 2.0-Jan 04. EUREPGAP c/o FoodPLUS GmbH, Cologne, Germany.

Remark:

The standard title has been revised from “Thai Agricultural Commodity and Food Standard (TACFS)” to “Thai Agricultural Standard (TAS)” in accordance with the enforcement of the Agricultural Standards Act B.E. 2551 (2008).



**NOTIFICATION OF THE NATIONAL COMMITTEE ON
AGRICULTURAL COMMODITY AND FOOD STANDARDS
SUBJECT: GOOD AGRICULTURAL PRACTICES FOR OKRA
B.E. 2548 (2005)**

The resolution of the 1/2548 session of the National Committee on Agricultural Commodity and Food Standards on 30 May B.E.2548 (2005) agreed to elaborate a Thai Agricultural Commodity and Food Standard on Good Agricultural Practices for Okra. This standard would be advantage for quality improvement, trade facilitation and consumer protection.

Therefore, the National Committee on Agricultural Commodity and Food Standards, mandated by the resolution of the Cabinet on 19 November B.E.2545 (2002), notifies the establishment of Thai Agricultural Commodity and Food Standard on Good Agricultural Practices for Okra to be used as a voluntary standard as attached herewith.

Notified on 29 July B.E.2548 (2005)

Khunying Sudarat Keyurapan

Minister of Agriculture and Cooperatives

Chairperson of the National Committee on Agricultural Commodity and Food Standards

THAI AGRICULTURAL STANDARD

GOOD AGRICULTURAL PRACTICES FOR OKRA

1. SCOPE

1.1 This Thai Agricultural Standard (TAS) covers the production system and its evaluation of okra with scientific name, *Abelmoschus esculentus* L. Moench of Malvaceae family. It includes all steps from production in the field to collecting house in order to obtain safe and fresh okra with quality suitable for consumption.

1.2 This GAP for okra is implemented jointly with the Thai Agricultural Standard for Okra.

2. DEFINITION

Terms used in this TAS are explained as follows:

2.1 Planting plot means the boundary of the area in which crop is planted to is not connected to other areas. In case the boundary is connected to others, but the production process system which includes input management, care planning set up, and personnel management in the planting plot is clearly different.

2.2 Organic fertilizers mean fertilizers derived from organic materials are manufactured with processes of humidification, chopping, grinding, fermentation, sifting, or other processes, but they are not chemical fertilizers nor biofertilizers.

2.2.1 Compost means a completely decomposed organic fertilizer. When it is applied to plants, it releases necessary nutrients to plants.

2.2.2 Manure means an organic fertilizer from animals' excretion is completely decomposed by micro-organisms.

2.3 Biofertilizer means a fertilizer containing live microorganisms is used to improve soil in terms of biological, physical and biochemical properties, and it also refers to micro-organism culture starter.

2.4 Hazardous substances mean the following substances_:

- explosive
- flammable substances
- oxidizing agents and peroxide
- toxic substances
- substances causing diseases
- radio active substances
- mutagenic substances
- corrosive

- irritant substances
- other substances, either chemicals or anything which may cause harmful to humans, animals, plants, properties or environments.

2.5 Pesticides mean hazardous substances regulated by the Department of Agriculture in accordance with the Notification of the Ministry of Industry regarding the list of hazardous substances issued stipulated under Hazardous Substances Act B.E. 2535.

2.6 Hygiene means the right characteristics in accordance with good practices such as various conditions and criteria necessary in the production process in order to obtain safe produce and suitable for consumption.

2.7 Pests mean species or strains of plants, animals or living organisms that cause diseases which are harmful to plants or their produce.

3. PROVISION CONCERNING CONTROL POINT, REQUIREMENT AND INSPECTION

The control point, requirement and inspection for good agricultural practice for okra are defined in Table 1.

Table 1. The Control Point, requirement and inspection
(see details of recommendation in Appendix C)

Control Point	Requirement	Inspection
1. Water sources	- Water source must be in the contaminant free environment.	- Visual inspection of the environment. If there is any risk, have the water quality analysed.
2. Plantation area	- The area is safe from hazardous substances which could cause contamination on the produce.	- Visual inspection of the environment. If there is any risk, have the soil quality analysed.
3. Application of pesticides	- If application is required, use it according to the recommendations of the Department of Agriculture, or follow the recommendations in the officially registered labels authorized by the Department of Agriculture, Ministry of Agriculture and Cooperatives. - In case the produce is for export, do not apply agricultural hazardous substances that have been banned by the trading country partner.	- Inspect the storage of pesticides. - Examine the records on the pest survey and the application of pesticides application data. - If evidence or situation are in doubt whether misapplication of pesticides, the produce shall be analysed.

Control Point	Requirement	Inspection
4. Preharvest processes 4.1 Pest control measures. 4.2 Application of organic fertilizers such as compost and manure	- Pest survey in the field is a must. If infestation is at damaging level, pest elimination must be carried out. If agricultural hazardous substances are applied, follow the provision 3. - Organic fertilizers must be completely fermented and decomposed. Application feature and method must be taken care of to prevent contamination of hazardous substances or pathogenic microorganisms at the harmful level to consumer. - Application of human excretion is prohibited.	- Inspect the record of the pest survey, prevention and elimination. - Inspect the record of the fertilizer nature and application. If there is any risk, have the fertilizers analysed.
5. Harvest and postharvest handlings. 5.1 Equipment and containers used in the harvest. 5.2 Harvesting Method	- Equipment and containers used in the harvest must be clean. They shall not cause damages to produce quality, and shall not cause contaminations that affect consumers' safety. - Harvest the pod by cutting with sharp and clean equipment. Care must be taken not to bruise or damage the pod. - Pod base must be clean, the cut is smooth and square.	- Inspect equipment and containers. - Inspection of the harvesting method.
5.3 Postharvest Handling Method	- Harvested produce must be carefully handled in order not to bruise or damage the pod. - Okra pod is sorted for defects or inferior quality classification and size prior to distribution. This is to refer to provisions in Thai Agricultural Standard for Okra (TAS 1501-2004) or in accordance with the provisions of trade partners.	- Inspection okra that has been harvested and postharvest handled.

Control Point	Requirement	Inspection
6. Produce holding, moving in plantation area, storage and collection 6.1 Moving, storage and collecting of produce. 6.2 Traceability	- Equipment, containers and vehicles in the moving of produce must be clean, not be contaminated that affect the safety in consumption. - Storage site must be clean and hygienic, not be exposed to direct sunlight with good ventilation, free of heat accumulation, and able to prevent contaminations of foreign matter, hazardous substances, pathogenic carrier animals including pets. - During the produce is in storage and moving, it must be identified that it is able to be traced back of its origin.	- Inspect the site, equipment, containers, vehicles, operation steps, moving method, storage and collection of produce. - Check the affixing code, mark or record the information indicating produce origin.
7. Personnel hygiene	- Taken good care of personnel hygiene is a must in order to prevent okra from pathogenic microorganism contamination from human direct contact with okra particularly at the harvest and postharvest handling steps.	- Inspect the operation at harvest and postharvest handling steps and/or interview the workers.
8. Data recording	- Data must be recorded on - the survey and control measures of pests. - fertilizer nature and its application in accordance to record-form samples in Appendices A and B.	- Inspect data record.

4. RECOMMENDATION ON GOOD AGRICULTURAL PRACTICE FOR OKRA

This recommendation is provided for farmers who produce okra. The details are explained in Appendix C.

Appendix A, Example

Data Record Form for Pest Survey and Control Measures

Planting Plot Owner's Name, Mr./Mrs./Miss.....Family Name.....

Planting Plot Owner's Registration No. or Farmer's ID NO. □□□□□□□□□□□□□□□□ Planting Plot Serial No.

Planted Crop.....	Variety.....	Planting Plot No.....	Planting Area.....	Rai	Average.....	Rai	No. of Plants.....
-------------------	--------------	-----------------------	--------------------	-----	--------------	-----	--------------------

Year of Operation..... **Harvesting Period (range)**

[illegible]

Appendix B, Example**Data Record Form for Fertilizer Nature and Its Application****Data of Fertilizer Nature****Planting Plot Owner's Name, Mr./Mrs./Miss.....****Family Name.....****Planting Plot Owner's Registration No. or Farmer's ID NO. □□□□□□□□□□**

Fertilizer Description	Date of Purchase	Amount	Nature	Specific Description ^{1/}	Recording Person

^{1/} Specific description of the purchased fertilizer includes manufacturer and type. In case of organic or biofertilizer it is required to indicate manufacturer and type including manufacturing process.

Fertilizer Application Data

Date	Kind of Fertilizer	Applied Amount	Application Method	Planting Period ^{2/}

^{2/} Planting period includes fertilizer application period prior to planting, and when the plant is 20 days old period or etc..

APPENDIX C

GUIDELINES OF GOOD AGRICULTURAL PRACTICES FOR OKRA

1. WATER SOURCE

1.1 Water for growing process should be obtained from the source that is not in the environment risky to contamination, and the water quality is suitable for agricultural propose. It is not the industrial waste water or contaminated water from health hazardous materials such as agricultural hazardous substances, heavy metals, pathogenic microorganisms. If it is necessary to use such water, clear evidence or proof that the water has been treated and can be for agricultural use must be presented.

1.2 At the beginning of working on agricultural system, at least one water sample should be collected for analysis for hazardous material contamination depending on the risk of water source, and have the detail recorded in the record-form 1 sample (water and soil analysis report). The analysis is carried out by government laboratories or those which are accredited. Water analysis report must be kept for evidence.

1.3 Water sources for agriculture should be permanent, and the water source and environment are to be conserved.

2. PLANTING AREA

2.1 Set up the assigned plot data indicating : owner's name of the planting area and address, name of plot keeper (if any) and address, plot location and its map, planting plot layout, kinds of crops and varieties, history of land utilization at least the past 3 years and other details as shown in the example record form 2. (general data of the owner's planting area.

2.2 In case the growing area is near or in industrial location or risky area. At the beginning of working on agricultural system, at least one soil sample should be analysed by official laboratory or officially accredited laboratory for soil property and contamination of hazardous materials depending on the risk of the area and have the data recorded in the record-form 1 sample (water and soil analysis result). Have the analysis result report kept for evidence.

3. MANAGEMENT OF PESTICIDES

3.1 If there is an application of pesticides, it is applied in accordance to the recommendation or referring to the Department of Agriculture recommendation or recommendation in the label which is correctly registered with the Department of Agriculture, The Ministry of Agriculture and Cooperatives. The pesticides application must be in line with pests found in the survey. Stop applying pesticides prior to harvest in accordance with the time period indicated in the label accompanying each kind of pesticides or following the recommendation of the Department of Agriculture and record the data in the record-form in Appendix A (example of data record form for plant pest survey and the application of pesticides).

3.2 The use of agricultural hazardous substances is to apply them legally under the hazardous substance registration number and recommendation on the label provided for the crop. Do not use pesticides which are banned from production, import, export or possession according to Hazardous Substance Act B.E. 2535 (1992). In case of the production for export do not use pesticides which are banned by trading country partners.

3.3 Read recommendation on the label thoroughly to understand the property and how to use to the pesticide prior application.

3.4 Participants and laborers who work in the field of pest control measures should know : pests, selection of agricultural hazardous substances and their application rate, selection of chemical sprayer and spray nozzle equipment including the right chemical spraying method. The chemical sprayer is maintained in ready prepared condition which can be used at any time. To protect toxic substance contamination on garments and the body, the operator should wear well covered clothes with toxic substance protection gears such as mask or nose cover cloth, gloves, cap and shoes.

3.5 Prepare agricultural hazardous substance with the right concentration. Before application the volume is adjusted and well agitated. Spraying such substance when the wind is calm either in the morning or evening period. Avoid application during strong sunlight or wind, and during operation the operator should be over the wind direction at all time.

3.6 Agricultural hazardous substances are prepared just enough for one single use. There should be no left over of such substances in the tank.

3.7 When the agricultural hazardous substance is used up, its container is rinsed a few times with water. The rinsed water is collected in the spraying tank for next application.

3.8 The empty agricultural hazardous substance container must be damaged in order to prevent its reuse. It is then discarded at the site particularly provided for such container or it is destroyed by burying in the ground with sufficient depth that no animal can dig it up and away from water sources, and burning the container is prohibited.

3.9 After every spraying of agricultural hazardous substance, the operator must immediately take shower, shampoo and change clothes which must be well laundered each time.

3.10 The container containing agricultural hazardous substance which cannot be used up in one time is tightly closed when not in use, and it is stored in the location provided for the substance.

3.11 All kinds of agricultural hazardous substances used in the production process are stored in the well closed location, safe, rain and sunlight proof, and with good ventilation.

3.12 The storage location for agricultural hazardous substances must be isolated in order to prevent of contamination these substances with the produce, foods and environment.

3.13 Agricultural hazardous substances must be kept in well closed containers with clearly identified label and are separately stored in groups without mixing with fertilizers, plant growth regulators and various plant supplementary nutrients. After opening the agricultural hazardous substance container it is prohibited to transfer the content out of the original container.

3.14 accidental prevention materials , tools and first aid such as eye lotion, clean water, sand and fire extinguisher equipment. must be provided in the agricultural hazardous substance storage or application location

3.15 Hazardous substances which are banned from production, import, export, or possession according to Hazardous Substance Act B.E. 2535 (1992) are not stored in the chemical storage site or within the growing plot.

3.16 Agricultural hazardous substance users should receive training on how to use the substances correctly.

4. PRETHARVEST PROCESS

4.1 Pest Control Measure

4.1.1 Farmers should know the species and life cycle of important plant pests including their good control measures by taking under consideration of environment and ecological system. Description of important okra pests are detailed in Appendix D.

4.1.2 Trace the various stages of pest epidemic. If the found amount is at the economic damaging level, control measures of such pest is properly carried out along the government recommendation, and record data in accordance to data record-form sample in Appendix A (example of data record form for plant pest survey and the application of pesticides).

4.1.3 Plant pest control measures should be carried out with any method or combination of the following :

4.1.3.1 Mechanical method such as the use of sticky glue trap, up root the sick plant and have it destroyed, weed control by labor while it is young or before the flowering stage and mulching at the planting row.

4.1.3.2 Natural enemy method such as biological sources, parasites and predators.

4.1.3.3 Extracts of natural material method such as the neem extract.

4.1.3.4 Chemical method such as effective agricultural hazardous substances with official recommendation.

4.2 Production Inputs

4.2.1 Provide a list of production inputs, their origin, and specific details of important production inputs such as seeds, fertilizer and agricultural hazardous substances which are used in the production process. It also indicates details, the amount, the date of purchase and data record.

4.2.2 Seeds

4.2.2.1 Select seeds of market required variety.

4.2.2.2 Select standard quality seeds which tolerate plant pests.

The seeds are from reliable seed producer or they were collected from the field / plant of good quality.

4.2.2.3 Record related details in the Example record form 2 (General Data of Planting Area Owner) such as variety name, distributing company, production date or selected plot for seed collection.

4.2.2.4 Mix the seed with agricultural hazardous substance. It is used in accordance with the method and rate recommended on the label of the legally registered substances.

4.2.3 Organic fertilizer application

There should be good management to prevent produce from microorganism, chemical and physical contaminations at the unsafe level to consumption with the following practice guideline:

4.2.3.1 Organic fertilizer should have gone through fermentation process or been completely decomposed or other processes sufficient to reduce amount of pathogenic microorganisms. Do not use human excretion for fertilizer.

4.2.3.2 Water waste sediment should not be used as raw material to produce organic fertilizer. If it is used, there should be data indicating that the organic fertilizer does not contain contaminants of heavy metals at the hazardous level.

4.2.3.3 If organic fertilizer is bought from distributor, there should be information of type or process that the fertilizer manufacturer uses to reduce the population of pathogenic microorganisms. It would be better to have certified document from the producer indicating its characteristics such as the fertilizer analysis, details of its chemistry and microorganism characteristics.

4.2.3.4 Method of organic fertilizer application

Should not apply organic fertilizer during or near the harvesting period.

4.2.3.5 The fermentation, decomposing or storage area for organic fertilizer should be far from okra field which will not be contaminated from rain water leaching or flood.

4.2.3.6 Record details of obtaining and application of the fertilizer such as date, kind, amount and method of organic fertilizer application including during okra growing period that the fertilizer is applied. These is carried out in the record form sample in Appendix B (Example of data record form for fertilizer nature and its application) and have it kept for inspection.

4.2.4 Chemical fertilizer application select specific chemical fertilizers which are legally registered with the Department of Agriculture, the Ministry of Agriculture and Cooperatives. Select suitable fertilizer for the growing plant, at the recommended rate on the label. This should be jointly applied with organic fertilizer.

4.3 Agricultural Equipment and Tools

4.3.1 Provide a list and the storage of agricultural equipment and tools.

4.3.2 Provide of suitable and sufficient agricultural equipment for operation.

4.3.3 Provide storage facility in good proportion for agricultural equipment and tools. It is safe and easy to use them.

4.3.4 Set up agricultural equipment and tool maintenance and repair plans, and there are activities according to the set up plan with data recording of each maintenance.

4.3.5 There is check up of agricultural equipment and tool condition before use such as the chemical sprayer and harvesting equipment. Agricultural equipment and tools which have to be accurate in the operation such as the spraying nozzle for agricultural hazardous substances should be constantly calibrated. If there is discrepancy, it is adjusted, repaired or get a new one with efficiency in accordance with the standard.

4.3.6 Agricultural equipment and tools including containers for packaging and transport of produce shall be cleaned every time before and after use and before storage.

4.4 By-product and Waste Management

4.4.1 Garbage is clearly separated such as paper carton, plastic, glasses, oil, chemicals and plant waste. There should be enough number of garbage cans which are clearly identified of the garbage dumping station.

4.4.2 All plant parts must be taken out of the field in order to prevent pest harboring area and contamination of pests.

4.4.3 Burn the diseased-plant-twigs outside the growing plot.

4.4.4 Plant waste or non-diseased branch trimmed from the tree can be used for compost or green manure.

5. HARVEST AND POSTHARVEST HANDLINGS

5.1 Equipment used in the harvest of okra such as knives which must be sharp and clean. After used they are cleaned before storage.

5.2 Containers for produce during harvest must be clean and they are cleaned every time before use.

5.3 Method of harvesting okra should be carried out as the following:

5.3.1 Harvest should be carried out early in the morning.

5.3.2 Use sharp knife to harvest one pod at a time and cut it square; place the produce carefully in the container, do not toss it.

5.3.3 Completely dress up, wear cotton or rubber gloves at each time of harvest to protect skin irritation.

5.4 Postharvest handlings should be carried out as follows:

5.4.1 Okra is immediately brought under the shade that has good ventilation, do not leave it in the sunlight. 5.4.2 Spread okra pods on clean table, do not pile them because of heat dissipation.

5.4.3 Okra pods with defects and inferior quality is sorted out, and sorted for quality and size classification in accordance with provisions of Thai Agricultural Commodity and Food Standard for Okra (TAS 1501-2004) or according to the agreement established with the buyer, and have the operating information recorded.

6. PRODUCE HOLDING, MOVING WITHIN THE PLANTING FIELD STORAGE AND COLLECTION

6.1 The container for okra must be clean, hygienic with good ventilation property and durable for the transportation. It is free from foreign matter and smell.

6.2 Containers for produce are separated from those for moving or transport of agricultural hazardous substances or fertilizer in order to prevent contaminant which causes damage to the produce and harmful to consumption. In case the produce container cannot be separated from the others, careful cleaning of the container is a must to prevent contamination.

6.3 Equipment and vehicles in the moving must be clean.

6.4 Temporary holding or storage facilities must be clean and hygienic such as far away from dirty sources, good air circulation, no heat accumulation, protection of hazard from pathogenic carrier animals including other pets, and must protect okra from sunlight.

6.5 If okra is not transported to the buyer, it should be stored at 8-15° C.

6.6 During storage and moving of produce, code or mark should be affixed indicating the planting plot and the farmer source, and the harvest date on the container in order to facilitate traceability and improve efficient flow of the produce.

7. PERSONNEL HYGIENE

7.1 Especially after harvest persons who will have direct contact with okra should take care of personnel hygiene in order to prevent the produce from contamination.

7.2 Provide sufficient personnel hygienic facilities which are also near the production site, and be able to get rid of various wastes; and avoid contamination to the growing site, the produce and the production inputs.

7.3 Sick personnel who may spread diseases through to produce such as contagious diseases of the digestive tract system, diarrhea and dysentery is prohibited to enter into the operation area. Sick participants or laborers are required to report to the production manager.

8. DATA RECORDING

8.1 Set up document in steps of operation, a list of various important documents and record the data for certified inspection of okra production system.

8.2 Record-form and document should be updated for that season production. In case there is more than one production plot. Signature of the worker or recorder should be signed every time when there is a recording.

8.3 Data record shall be kept for at least 3 consecutive years of production or depending on the trade partners' requirement. Record-form and the list of documents that can be checked should be prepared as follows :-

8.3.1 Data record-form for pest survey and control measures in Appendix A.

8.3.2 Data record-form of fertilizer nature and its application in Appendix B with details of date, amount, fertilizer distribution company / store particularly organic fertilizer including biofertilizer. In case the fertilizer cannot be checked of its source or it is unreliable. It should be sent to organization or reliable laboratory for analysis of contaminants such as hazardous substances, heavy metals or pathogenic microorganisms. Have the analytical report kept for evidence.

8.3.3 Document indicating list of the equipment and production input storage with the detail of storage site and method. In case there is no recording of document, there should be storage site management such as label which clearly indicates the list, and separate the production inputs and equipment in good partition or grouping, they are also clean, safe and easy to use them.

8.3.4 Documents or reports indicating analytical result of soil, water and various production inputs.

APPENDIX D

IMPORTANT PESTS OF OKRA

Pest List	Symptom and the Destruction	Method and Survey Criteria
Leaf spot	The fungi attack the oldest leaves first, then spread to the top. Upper side of the leaf is brownish yellow, whereas the under side of the leaf is powdery white of fungi. If the symptom is severe the leaf which turns into blackish-grey, becomes dehydrated and shed. The plant declines, this is found in okra at about 60 days old. The disease is more epidemic in cold season period with high humidity, heavy dew and fog.	Survey the destruction caused by leaf spot disease. If the symptom is found at 5 percent of the leaf area at the lower leaf, control measures must be carried out.
Scab	The fungi attack young pods. At early stage very small swellings of black color appear scattering throughout the pod. When lesions expand to join each others, the pod becomes twisted with dry flakes. This disease spreads easily during rainy season which has high humidity, particularly growing plots that are surrounded by water in ditches are severely epidemic.	Survey the destruction caused by scab. If the young pod is infested, control measures must be carried out.
Beet armyworm	The adult is a moth which lays hairy white eggs in cluster on young plant parts such as leaves and petioles. The larvae feed on various plant parts. Fully grown larvae become pupae in the soil.	Survey the destruction caused by beet armyworm. If more than one cluster of eggs or one larva per plant is found, control measures must be carried out.
Cotton leaf hopper	Shape of the adult insect is elongated of light green color, it lays single egg along the leaf vein or petiole. Both the nymph and adult suck leaf sap causing the leaf turning brown and curled. It is epidemic throughout the growing season.	Survey the destruction caused by cotton leaf hopper. If one insect is found per pod or leaf, control measures must be carried out.
Cotton Ballworm	The adult lays egg in single along all young plant parts such as leaves, petioles and young tips. The early stage larvae feed on inside the pods, it is severely epidemic during flowering and fruiting period.	Survey destruction caused by cotton ballworm. If more than one egg or one larva per two, control measures must be carried out.
Cut-worm	The adult is a moth which lays eggs in cluster of brown color similar to that of rice straw along leaves, branchlets and branches. The early stage larvae	Survey the destruction caused by cut-worm. If more than one larva or one egg cluster per two plants is found, control measures must be carried out.

Pest List	Symptom and the Destruction	Method and Survey Criteria
	stay in group feeding on leaves, branches and pods. When they grow up, they make their way to feed on all plant parts. Fully grown larvae become pupae in the soil. It is epidemic throughout the growing season.	
Whitefly	The nymph and adult feed on leaf sap and are pathogenic carrier of important virus causing yellow vein disease which causes variegated yellow color along leaf veins, yellow pods. It is epidemic throughout the growing season.	Survey the insect epidemic. If it is found, control measures must be carried out.

Example
Record Form 2 (Page 1/4)
General Data of Planting Area Owner
Data of Year

Plantation Owner's Name (Mr./Mrs./Miss)..... Family Name.....

Register No. of Planting Area Owner ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Divided into..... Planting plot(s)

Address, Village Name..... Moo..... No.....

Street..... Alley.....

Sub-district..... District..... Province.....

Post Code..... Tel..... Fax.....

E-mail..... Website.....

Contact person or Representative

(Mr./Mrs./Miss)..... Family Name.....

Address, Village Name..... Moo..... No.....

Street..... Alley.....

Sub-district..... District..... Province.....

Post Code..... Tel..... Fax.....

E-mail..... Website.....

Signature of Entrepreneur.....
 (.....)

Signature of contact person or Representative.....
 (.....)

Example
Record Form 2 (Page 2/4)
General Data of Planting Area Owner

Name Planting Area Owner (Mr./Mrs./Miss)..... Family Name.....

Register No. of Planting Area Owner

Planting Plot Location, No. ___ Moo ___ Sub-district _____ District.....

Province..... Postal Code.....

Total No. Planting Plot(s) Area _____ Rai

Map of planting plot location, communication route and significant places in the vicinity for travel convenience to the planting plot.



Example
Record Form 2 (Page 3/4)
General Data of Planting Area Owner

Planting Plot NO. _____ Operating Year _____

Planting Plot Location, Moo _____ Sub-district _____ District _____

Province _____ Area _____ Rai _____

1.1 Planting Variety

Variety _____ Spacing _____ Planting Amount _____ Planting Date (Plant Age) _____

Variety _____ Spacing _____ Planting Amount _____ Planting Date (Plant Age) _____

Variety _____ Spacing _____ Planting Amount _____ Planting Date (Plant Age) _____

Variety _____ Spacing _____ Planting Amount _____ Planting Date (Plant Age) _____

1.2 Irrigation System _____ **Rate of Water Supply** _____ litre/Hour.

1.3 Soil Type _____

1.4 History of Production Area Utilization Prior to Present Crop Planting of the Past 3 Years.

☐ Area has never been cultivated.

☐ Area has been cultivated. Crop Cultivated

year 1 _____

year 2 _____

year 3 _____

1.5 History of Plant Pest Infestation and Control Measures

Name of Plant Pest _____ Infestation year _____ Infestation Area Percentage _____ Control measures _____

Name of Plant Pest _____ Infestation year _____ Infestation Area Percentage _____ Control measures _____

Name of Plant Pest _____ Infestation year _____ Infestation Area Percentage _____ Control measures _____

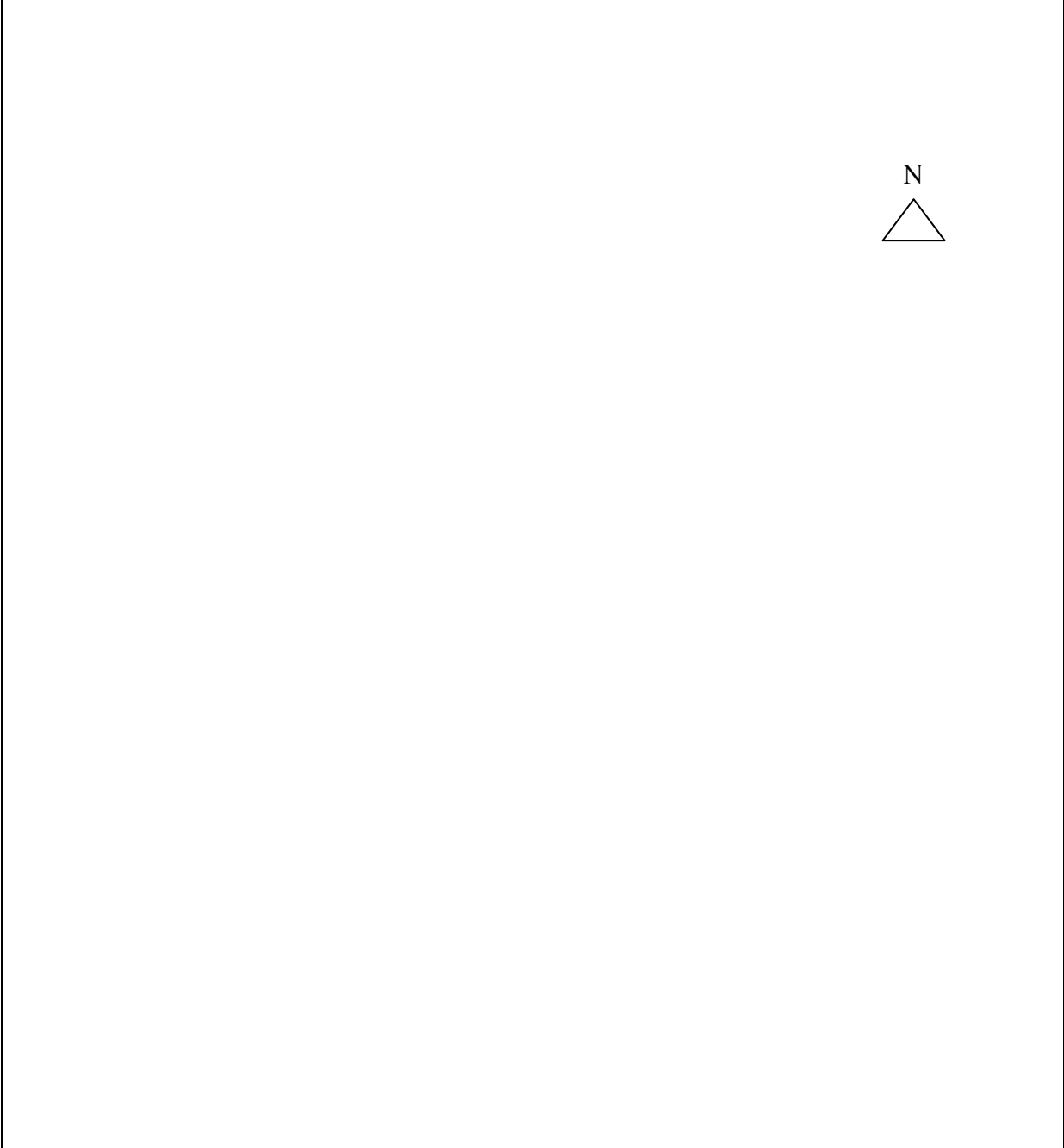
Name of Plant Pest _____ Infestation year _____ Infestation Area Percentage _____ Control measures _____

1.6 Other data

Example
Record Form 2 (Page 4/4)
General Data of Planting Area Owner

Planting Plot NO. Operating Year

Layout of planting plot (indicating water source buildings that exist in the planting plot).



N
