DOMINICA NATIONAL STANDARD

SYSTEMS APPROACH FOR PEST RISK MANAGEMENT OF FRUIT FLIES (TEPHRITIDAE)

D-DNS 15: 202x

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DRAFT

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This is a draft and should not be regarded or used as a Dominica National Standard

Last date for comments ……..

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GENERAL STATEMENT

The Dominica Bureau of Standards was established under the Standards Act (#4) of 1999 and started operations in April 2000. A broad-based 15-member Standards Council governs the affairs of the Bureau.

The Standards Act gives the Bureau the responsibility to facilitate the development and promotion of Standards and Codes of Practice for products and services for the protection of the health and safety of consumers and the environment as well as for industrial development in order to promote the enhancement of the economy of Dominica.

The Bureau develops Standards through consultations with relevant interest groups. In accordance with the provisions of the Standards Act, public comment is invited on all draft Standards before they are declared as Dominica National Standards (DNS).

The Bureau is a correspondent member body of the International Organization for Standardization (ISO), an affiliate member of the International Electro-technical Commission (IEC), and a member of the Caribbean Regional Organization for Standards and Quality (CROSQ) and the Pan American Standards Commission (COPANT). The Bureau is the local agent for foreign Standard Body, the American Standards for Testing and Measurement (ASTM). The Bureau also serves as the enquiry point for the World Trade Organization (WTO) on matters pertaining to the Technical Barriers to Trade (TBT) Agreement and is the Contact Point for Codex Alimentarius.

In accordance with good practice for the adoption and application of Standards, Dominica National Standards are subject to periodic review every five years.

Amendments

Amendment No.	Date of Issue	Text (s) Affected

DOMINICA NATIONAL STANDARD
SYSTEMS APPROACH FOR PEST RISK MANAGEMENT OF FRUIT FLIES (TEPHRITIDAE)

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TECHNICAL SECRETARY
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0.0 FOREWORD

0.1. This Dominica National Standard was adopted by the Bureau of Standards (the Bureau) of the Commonwealth of Dominica on _____ after the draft was finalized by Technical Committee for Food Products, Processes and Services (FPPS) and has been approved by the Minister responsible for the Bureau.

0.2. This Standard became effective as a Compulsory Standard on the date notified by the Minister with responsibility for the Bureau of Standards in a Notice published in the Commonwealth of Dominica Official Gazette on _____.

0.3. This standard is an identical adoption of International Standards for Phytosanitary Measures (ISPM) 35: 2018 - Systems approach for pest risk management of fruit flies (Tephritidae).

0.4. Acknowledgement is given to *International Plant Protection Convention* (*IPPC*) for providing permission to adopt ISPM 35: 2018.

0.5. Although the editorial style and layout of the ISPM 35: 2018 are not in conformity with that of Dominica's Standards, the identical adoption has been approved as suitable for publication as a Dominica National Standard.

INTRODUCTION

Scope

This standard provides guidance for the development, implementation and verification of integrated measures in a systems approach as an option for pest risk management of fruit flies (Tephritidae) of economic importance to facilitate trade of fruit fly host products or to minimize the spread of regulated fruit flies within an area.

Annex 3, Appendix 1 and Appendix 2 of ISPM 26 also apply to this standard.

References

The present standard refers to ISPMs. ISPMs are available on the International Phytosanitary Portal (IPP) at https://www.ippc.int/core-activities/standards-setting/ispms.

Definitions

Definition of phytosanitary terms used in this standard can be found in ISPM 5 (*Glossary of phytosanitary terms*).

Outline of Requirements

For the development of a fruit fly systems approach (FF-SA), the relationship between host, target fruit fly species and area of production of the host fruits and vegetables[1] should be considered. The options for pest risk management measures should be determined by means of pest risk analysis (PRA).

An FF-SA includes at least two independent measures, which may be applied throughout various stages of the process, specifically during the growing period and harvest; post-harvest and transportation; and entry and distribution within the importing country. An FF-SA may be developed in an area of low pest prevalence or temporary or localized pest absence of the target fruit fly species in combination with other measures (such as selection of less susceptible hosts, crop management practices or post-harvest handling) to reduce pest risk to meet the phytosanitary requirements of the importing country. Establishment and maintenance of a fruit fly area of low pest prevalence (FF-ALPP) should be considered one of the optional measures when developing a systems approach; however, it should not be considered mandatory.

Guidance for the establishment and maintenance of an FF-ALPP is available in Annex 1.

Parameters used to estimate the level of fruit fly prevalence and the efficacy of trapping devices for surveillance should be determined following the information in Annex 2.

For development, implementation and verification of an FF-SA, operational procedures are necessary. Conformity with these procedures should be ensured and verified by the national plant protection organization (NPPO) of the exporting country. Procedures should be monitored during the implementation and corrective actions should be taken in case of non-conformity.

[1] Fruits and vegetables hereafter are referred to as fruits.

The development, implementation and verification of an FF-SA should be adequately documented and the documentation reviewed and updated when necessary, by the NPPO of the exporting country.

BACKGROUND

Many species of fruit flies are pests of economic importance and their introduction may pose a pest risk. To identify and manage the target fruit fly species risk, a PRA should be conducted by the NPPO of the importing country and phytosanitary measures may be applied (ISPM 2 (*Framework for pest risk analysis*), ISPM 11 (*Pest risk analysis for quarantine pests*)).

Systems approaches have been developed as pest risk management measures in situations where a single measure is not available or practicable, or in cases where a systems approach is more cost effective than the single measure available. The decision to implement a specific FF-SA depends on the particular relationship between the host fruit, the target fruit fly species and the specified fruit production area.

A systems approach requires a combination of at least two measures that are independent of each other, and may include any number of measures that are dependent on each other (ISPM 14 (*The use of integrated measures in a systems approach for pest risk management*)). Areas of low pest prevalence may be used as part of a systems approach (see ISPM 14 and ISPM 22 (*Requirements for the establishment of areas of low pest prevalence*)).

Treatments used in an FF-SA are those not considered sufficiently efficacious to be applied as a single measure. The measures may be applied in different places at different times and may therefore involve a number of organizations and individuals.

Often, countries have used phytosanitary measures such as treatments or fruit fly pest free areas (FF-PFAs) (ISPM 26 (*Establishment of pest free areas for fruit flies (Tephritidae)*)) to support import or movement of host fruit. In other cases, prohibition has been applied. An FF-SA may be an alternative to facilitate the export and movement of fruit fly hosts into endangered areas. NPPOs may recognize FF-SAs as being equivalent to single measures. The exporting country may seek formal approval of equivalence of these measures with the importing country. In cases where an effective FF-SA has been implemented, components of those systems may be used by other importing and exporting countries to facilitate the movement of fruit from areas with similar conditions.

An FF- SA can be applied in an area of fruit production as small as a production site or as large as a country.

REQUIREMENTS

1. Decision to Implement an FF-SA

It is the responsibility of the importing country to establish and communicate its technically justified phytosanitary import requirements. A combination of pest risk management measures integrated into an FF-SA is one of the options that the importing country may select as the basis for phytosanitary import requirements (ISPM 14).

The development of an FF-SA is the responsibility of the NPPO of the exporting country. An FF-SA may be developed and implemented in cases where:

(1) The importing country, in its phytosanitary import requirements, specifies a systems approach to be used in the exporting country.

(2) The importing country does not explicitly require a systems approach, but the NPPO of the exporting country deems a systems approach to be a suitable and effective approach for achieving the importing country's phytosanitary import requirements. The exporting country may need to negotiate formal approval of the equivalence of measures with the importing country (ISPM 24 (*Guidelines for the determination and recognition of equivalence of phytosanitary measures*)).

An FF- SA should have the appropriate combination of measures to achieve the appropriate level of protection. They should be scientifically sound and be selected to meet the phytosanitary import requirements. Aspects of operational feasibility include cost-effectiveness of the measures to be applied while seeking to impose the least restrictive measures necessary to manage target fruit fly species risk.

The fruit production area proposed for implementing an FF-SA should be defined and the participating producers should be approved by the NPPO of the exporting country.

It may be advisable that NPPOs involve other stakeholders in the development of an FF-SA (ISPM 2).

Basic information required for the development of an FF-SA includes the following:

- The host should be identified to the species level. In cases where risk varies with the variety (e.g., because of varying tolerance to infestation), the host should be identified to the variety level (ISPM 37 (*Determination of host status of fruit to fruit fly (Tephritidae)*).
- The stage of maturity of the fruit being examined is relevant (ISPM 37).
- Data on the target fruit fly species associated with the host should be available (Annex 1).
- The fruit production area defined for implementing an FF-SA should be described and adequately documented with particular attention to host distribution in commercial areas as well as non-commercial areas, if appropriate.

In practice, FF-SAs may be applied to one or more hosts or target fruit fly species in the same fruit production area.

Development of an FF-SA

Measures may be applied at various stages from production of fruit within the exporting country to distribution within the importing country. The NPPO of the importing country may also implement one or more measures on arrival of the consignment. Measures applied at the different stages to prevent fruit fly infestation may include those described below.

Pre-planting:

- selecting planting sites with low pest incidence of target fruit fly species (e.g., FF-ALPPs, areas unsuitable because of geographical location, altitude or climate)
- selecting less susceptible fruit species or varieties

- sanitation
- managing hosts other than the crop
- intercropping with non-fruit fly host plants
- growing host fruit during specific periods when the pest incidence of target fruit fly species is low or temporally absent.

Growing period:

- flowering control and timing of fruit production
- chemical control such as insecticide bait treatments, bait stations and male annihilation technique, and biological control such as natural enemies
- physical protection mechanisms (e.g., bagging fruit, fruit fly protected structures)
- sterile insect technique
- mass trapping
- management of non-commercial hosts within the production area (e.g., elimination or replacement of other host plants by non-host plants where appropriate)
- monitoring and survey of the target fruit fly species (e.g., trapping or fruit sampling)
- sanitation (i.e., collection, removal and appropriate disposal of fallen fruit from the orchard or removal of mature fruit from the tree)
- fruit stripping.

Harvest:

- harvest at a specific stage of fruit development or time of the year
- safeguarding activities to prevent infestation at harvest
- surveillance, including fruit cutting
- sanitation (e.g., safe removal and disposal of fallen fruit).

Post-harvest and handling:

- safeguarding activities to prevent infestation, for example chilling fruit, refrigerated transport, processing in screen-protected packing rooms, warehouses and transit conveyances, using cold storage, wrapping of fruit
- monitoring for target fruit fly species absence by trapping in and around packing houses
- sanitation (e.g., removal of fruit with signs of infestation (culling) in packing houses)
- sampling, inspection (e.g., by fruit cutting) or testing
- treatments that are not considered sufficiently efficacious as a single measure - packing requirements (e.g., using insect-proof packaging) - ensuring traceability of lots.

Transportation and distribution:

- safeguarding activities to prevent target fruit fly species infestation
- treatments that are not considered sufficiently efficacious as a single measure (before, during or after transport)

- limiting distribution geographically or seasonally to areas where or periods when target fruit fly species cannot establish or where suitable hosts are not present.

Measures applied to several or all stages:

- community awareness programmes to generate support from the public
- control of movement of host fruit and other pathways into the area (e.g., requirements for production sites or islands).

3. Documentation and Record Keeping

The development, implementation and verification of an FF-SA should be properly documented by the NPPO of the exporting country. The roles and responsibilities of the NPPOs of the exporting and importing countries should be specified and documented. The documentation and records should be reviewed and updated regularly, maintained for at least 24 months and made available to the NPPO of the importing country upon request.

Documentation may include:

- phytosanitary import requirements and, if available, a report of the PRA
- identification and description of the measures for reducing risk
- description of the requirements for the operational procedures of an FF-SA
- description of the area intended for an FF-SA
- descriptions of host fruit to be exported and target fruit fly species
- details of the organizations involved and their roles and responsibilities and any linkages, including for example:
    - registration of organizations involved or stakeholders
    - agreement to cooperate in surveillance and control procedures
    - evidence of conformity with FF-SA requirements (origin of fruit, movement from place of production, selection and packing of fruit, transportation and safeguarding of fruit)
    - agreement to take appropriate corrective actions record keeping and availability
- description of pest surveillance and control programme
- survey results
- training programme for FF-SA participants
- traceability procedures
- technical basis for specific procedures
- survey, detection and diagnostic methodology
- description of corrective actions and records of follow-up
- reviews of the implementation of an FF-SA
- contingency plans.

4. Verification

The measures in an FF-SA should be implemented in accordance with the approved phytosanitary procedures and should be monitored by the NPPO of the exporting country to ensure the system achieves its objectives.

The NPPO of the exporting country has the responsibility to monitor the implementation and the effectiveness of all stages of an FF-SA. In cases where the operational procedures of an FF-SA were properly implemented, but one or more of the components did not provide sufficient pest risk management to give the required effectiveness of all stages, a revision of the FF-SA should be conducted to ensure that phytosanitary import requirements are met. This revision may not necessarily involve the suspension of trade. Other components of the FF-SA may not need to be verified again. The frequency of verification should be influenced by the design of the FF-SA.

The NPPO of the importing country may audit an FF-SA in agreement with the NPPO of the exporting country.

5. Tolerance Level

In many cases, the basis for developing an FF-SA may be that the target fruit fly species incidence is kept at or below a tolerance level (in connection with fruit flies, the term "specified pest population level" has sometimes been used instead of "tolerance level") specified by the NPPO of the importing country in the defined area, for example an FF-ALPP. This may be as a result of a naturally low target fruit fly species incidence or as a result of the implementation of control measures (Annex 2).

Evidence to support the target fruit fly species incidence being kept at or below the specified tolerance level may be required and, if so, should be obtained as a result of trapping or fruit sampling. Surveillance of target fruit fly species incidence may be conducted not only during the growing period of the host fruit but also during non-growing periods.

6. Non-conformity and Non-compliance

Non-conformity involves incorrect implementation or failure of an FF-SA. In such cases, the NPPO of the exporting country may suspend the trade from the non-conforming component of the FF-SA until corrective actions have been taken to address the non-conformity. Non-conformity may occur in one or more stages of an FF-SA. It is important to identify at which stage the non-conformity has occurred.

The NPPO of the exporting country should notify the NPPO of the importing country of any nonconformity that may have affected a shipment or phytosanitary certification.

The NPPO of the importing country should notify the NPPO of the exporting country of any cases of non-compliance (see ISPM 13 (*Guidelines for the notification of non-compliance and emergency action*)).

This annex is a prescriptive part of the standard.

ANNEX 1: Establishment of areas of low pest prevalence for fruit flies

This annex provides guidance for the establishment and maintenance of an FF-ALPP with the aim to facilitate trade by minimizing the risk of introduction or spread of regulated fruit flies. The guidance covers:

- confirming the operational and economic feasibility of the FF-ALPP
- describing the purpose of the FF-ALPP
- listing the target fruit fly species for the FF-ALPP
- operational plans
- determination of the FF-ALPP
- documentation and record keeping
- supervision activities.

Information on the typical applications of an FF-ALPP is available in Appendix 1 of this annex.

FF-ALPPs are generally used as buffer zones for FF-PFAs, fruit fly free places of production or fruit fly free production sites (either as a permanent buffer zone or as part of an eradication process), or for export purposes, usually in conjunction with other risk mitigation measures as a component of an FF-SA (which may include all or part of an FF-ALPP that acts as a buffer zone).

They may occur naturally (and subsequently be verified, declared and monitored or otherwise managed); they may occur as a result of pest control practices during crop production that suppress the population of fruit flies in an area to limit their impact on the crop; or they may be established as a result of control practices that reduce the number of fruit flies in the area to a specified low level.

The decision to establish an FF-ALPP may be closely linked to market access as well as to economic and operational feasibility.

If an FF-ALPP is established for export of fruit fly host commodities, the parameters for establishment and maintenance of the FF-ALPP should be determined and agreed to in conjunction with the importing country, in consideration of the guidance presented in this annex and in accordance with ISPM 29 (*Recognition of pest free areas and areas of low pest prevalence*).

The requirements for the establishment of FF-ALPPs in this annex can also be applied for movement of fruit between FF-ALPPs within a country.

The concepts and provisions of ISPM 22 apply to the establishment and maintenance of ALPPs for a specified pest, including fruit flies, and therefore ISPM 22 should be referred to in conjunction with this annex.

An FF-ALPP may be established in accordance with this annex under a variety of situations. Some situations may require the application of the full range of elements described by this annex, whereas others may require the application of only some of those elements.

Phytosanitary measures and specific procedures as further described in this annex may be required for the establishment and maintenance of an FF-ALPP by the NPPO. The decision to

establish an FFALPP may be based on all or some of the technical factors described in this annex, as appropriate. They include factors such as pest biology and control methods, which will vary according to the species of fruit fly for which the FF-ALPP is being established.

The establishment of an FF-ALPP should be considered against the overall operational and economic feasibility of establishing a programme to meet and maintain the low pest level and the objectives of the FF-ALPP.

An FF-ALPP may be established to facilitate the movement of fruit fly hosts from one FF-ALPP to another area of the same fruit fly pest status in order to protect areas endangered by a regulated fruit fly pest.

The essential prerequisite for establishment of an FF-ALPP is an area that can be delimited, monitored and verified by the NPPO to be of a specified fruit fly low pest prevalence level. The area may occur naturally as a result of climatic, biological or geographical factors that reduce or limit the fruit fly population through all or part of the year, it may be in place to protect an FF-PFA or to support sustainable crop production, or may have developed in response to suppression or eradication actions.

An area can be defined as an FF-ALPP for one or more target fruit fly species. However, for an FF-ALPP covering multiple target fruit fly species, trapping devices and their deployment densities and locations should be specified (see Appendix 1 of ISPM 26) and low pest prevalence levels determined for each target fruit fly species.

FF-ALPPs should include public awareness programmes of a similar nature as outlined in ISPM 26.

1. Operational Plans

An official operational plan is needed to specify the phytosanitary procedures required to establish and maintain an FF-ALPP.

The operational plan should describe the main tasks to be carried out such as surveillance activities, procedures to maintain the specified level of low pest prevalence, preparation of the corrective action plan, and any others that are required to achieve the objective of the FF-ALPP.

2. Determination of an FF-ALPP

Elements to be considered in the determination of an FF-ALPP are as follows:

- delimitation of the area (size, detailed maps including an accurate description of the boundaries or global positioning system (GPS) coordinates for the boundaries, natural barriers, entry points, location of commercial and, as appropriate, non-commercial hosts of the target fruit fly and urban areas)
- target fruit fly species and its/their seasonal and spatial distribution within the area
- location, abundance and seasonality of hosts, including, wherever possible, specification of primary (biologically preferred) hosts
- climatic characteristics, including rainfall, relative humidity, temperature, and prevailing wind speed and direction
- factors limiting and keeping fruit fly population(s) at low levels.

In areas where prevalence of fruit flies is naturally at a low level because of climatic, geographical or other reasons (e.g., natural enemies, availability of suitable hosts, host seasonality), the target fruit fly population may already be below the specified level of low pest prevalence without applying any control measures. In such cases, surveillance should be undertaken over an appropriate length of time to validate the low prevalence status and this status may be recognized in accordance with ISPM 8 (*Determination of pest status in an area*). If, however, the fruit flies are detected above the specified level of low pest prevalence (e.g., because of extraordinary climatic conditions) corrective actions should be applied. Corrective action plans are described in section 8 of this annex.

3. Documentation and Record Keeping

The phytosanitary procedures used for the determination, establishment, verification and maintenance of an FF-ALPP should be adequately documented. These procedures should be reviewed and updated regularly, including the corrective actions if required (as described in ISPM 22). It is recommended that a manual of procedures relating to the operational plan be prepared for the FF-ALPP.

Documentation for determination and establishment may include:

- list of fruit fly hosts known to occur in the area, including seasonality and commercial fruit production in the area (ISPM 37)
- delimitation records: detailed maps showing the boundaries, natural barriers and points where fruits may enter the area; description of agro-ecological features such as soil type, the location of main host areas of the target fruit fly, and marginal and urban host areas; and climatic conditions, for example rainfall, relative humidity, temperature, and prevailing wind speed and direction
- surveillance records:
    - trapping: types of surveys, number and type of traps and lures, frequency of trap inspection, trap density, trap array, trapping time and duration, number of target fruit flies captured by species for each trap, trap servicing (see Appendix 1 of ISPM 26)
    - fruit sampling: type, quantity, date, frequency and result (see Appendix 2 of ISPM 26)
- record of control measures used for fruit flies and other pests that may have an effect on fruit fly populations: type(s) and location(s).

For verification and maintenance, documentation should include the data recorded to demonstrate the population levels of the target fruit fly species are below the specified level of low pest prevalence. The records of surveys and results of other operational procedures should be retained for at least 24 months. If the FF-ALPP is being used for export purposes, records should be made available to the NPPO of the relevant importing country on request and verification may take place if necessary.

Corrective action plans should also be developed and maintained (see section 8 of this annex).

4. Supervision Activities

The FF-ALPP programme, including applicable domestic regulations, surveillance procedures (e.g., trapping, fruit sampling) and corrective action plans, should comply with officially approved procedures. These procedures may include official delegation of responsibility to key personnel, for example:

- a person with defined authority and responsibility to ensure that the systems and procedures are implemented and maintained appropriately
- entomologist(s) with responsibility for the identification of fruit flies to species level.

The NPPO should evaluate and audit the operation of the procedures for the establishment and maintenance of the FF-ALPP to ensure that effective management is maintained even where the responsibility to carry out specific activities has been delegated to outside the NPPO. Supervision of operational procedures include:

- operation of surveillance procedures
- surveillance capability
- trapping materials (traps, attractants) and procedures
- identification capability
- application of control measures
- documentation and record keeping
- implementation of corrective actions.

5. Establishment of the FF-ALPP

Elements for consideration when establishing an FF-PFA are described in ISPM 26 and may also be applied to establishing an FF-ALPP as defined in following subsections.

5.1 Determination of the specified level of low pest prevalence

Specified levels of low pest prevalence will depend on the level of risk associated with the target fruit fly species–host–area interaction. These levels should be established by the NPPO of the country where the FF-ALPP is located and with sufficient precision to allow assessment of whether surveillance data and protocols are adequate to determine that pest prevalence is below these levels.

Individual NPPOs may draw on a variety of factors when determining exactly what an appropriate level of pest prevalence should be for a given FF-ALPP. Some commonly considered factors include the following:

- levels stipulated by trading partners in order for trade to proceed
- levels in use by other NPPOs for the same or similar fruit fly species, hosts and agro-ecological conditions (including experience and historical data gained from the operation of other FF-ALPPs as to what levels are required to be maintained to achieve pest free fruits).

Establishment of the parameters used to estimate the level of fruit fly prevalence is described in Annex 2 of this standard.

5.2 Geographical description

The NPPO defines the limits of a proposed FF-ALPP. Isolation of the area (physical or geographical) is not necessarily required for the establishment of an FF-ALPPs.

Boundaries used to describe the delimitation of the FF-ALPP should be established and closely related to the relative presence of hosts of the target fruit fly species or adjusted to readily recognizable boundaries.

5.3 Surveillance activities prior to establishment

Before the establishment of an FF-ALPP, surveillance to assess the presence and level of prevalence of the target fruit fly species should be undertaken for a period determined by its biology, behaviour, climatic characteristics of the area, host availability and appropriate technical considerations. This surveillance should continue for at least 12 consecutive months.

6. Phytosanitary procedures

6.1 Surveillance activities

Surveillance systems based on trapping are similar in any type of ALPP. The surveillance used in an FF-ALPP may include those processes described in ISPM 6 (*Guidelines for surveillance*), on the trapping procedures described in Appendix 1 of ISPM 26 and any other relevant scientific information.

Fruit sampling is not widely used as a routine surveillance method for monitoring fruit flies in low prevalence areas except in areas where sterile insect technique (SIT) is applied, where it may be a major tool (see Appendix 2 of ISPM 26).

The NPPO may complement trapping for adults with fruit sampling for larvae. Fruit sampling may be especially useful for surveillance for fruit flies when no traps are available. If larvae are detected in fruit sampling, it may be necessary to rear the larvae to adults in order to identify them. This is the case particularly if multiple species of fruit flies may be present. However, fruit sampling alone will not provide sufficient accuracy for describing the size of the population and should not be solely relied on to validate or verify the FF-ALPP status. Surveillance procedures may include those fruit sampling procedures described in Appendix 2 of ISPM 26.

The presence and distribution of fruit fly commercial and non-commercial hosts should be recorded separately. This information will help in planning trapping and fruit sampling activities and may help in anticipating the potential ease or difficulty of establishing and maintaining the status of the relevant pest in the FF-ALPP.

The NPPO should have, or have access to, appropriate identification capabilities for identification of the target fruit fly species detected during the surveys (whether adult or larvae). This capability should also exist for the ongoing verification of FF-ALPP status for the target fruit fly species.

6.2 Reduction and maintenance of target fruit fly species population level

Specific control measures may be applied to reduce fruit fly populations to or below the specified level of low pest prevalence. Suppression of fruit fly populations may involve the use of more than one control option; some of these are described in Annex 3 of ISPM 26.

Because the target fruit fly species are either endemic or established in the area, preventive control measures to maintain fruit fly populations at or below the specified level of low pest prevalence are nearly always necessary (some FF-ALPPs may occur naturally). Efforts should be made by NPPOs to select those measures with least environmental impact.

Available methods include:

- chemical control (e.g., selective insecticide bait, aerial and ground spraying, bait stations and male annihilation technique)
- physical control (e.g., fruit bagging)
- use of beneficial organisms (e.g., natural enemies, SIT)

- cultural control (e.g., stripping and destruction of mature and fallen fruit, elimination or replacement of other host plants by non-host plants where appropriate, early harvesting, discouraging intercropping with fruit fly host plants, pruning before the fruiting period, use of perimeter trap hosts).

6.3 Phytosanitary measures related to movement of host material or regulated articles

Phytosanitary measures may be required to reduce the risk of entry of the specified pests into the FF-ALPP. These are outlined in Annex 3 of ISPM 26.

6.4 Domestic declaration of an FF-ALPP

The NPPO should verify the status of the FF-ALPP (in accordance with ISPM 8) specifically by confirming compliance with the procedures established in accordance with this annex (surveillance and controls). The NPPO should declare and notify the establishment of the FF-ALPP, as appropriate.

For the purposes of internal management, the continuing FF-ALPP status should be verified after it has been established and any phytosanitary measures for the maintenance of the FF-ALPP have been put in place.

7. Maintenance of the FF-ALPP

Once the FF-ALPP is established, the NPPO should maintain the relevant documentation and verification procedures (auditable), and continue the application of phytosanitary procedures as described in section 6 of this annex.

7.1 Surveillance

In order to maintain the FF-ALPP status, the NPPO should continue surveillance, as described in section 6.1 of this annex.

7.2 Control measures to maintain low prevalence levels of target fruit fly species

In most cases the control measures as identified in section 6.2 of this annex may be applied to maintain the FF-ALPP, because the target fruit flies are still present in the established area.

If the monitored fruit fly prevalence level is observed to be increasing (but remains below the specified level for the area), a threshold set by the NPPO for the application of additional control measures may be reached. At this point the NPPO may require implementation of such measures as described in Annex 3 of ISPM 26. This threshold should be set to provide adequate warning that the specified level of low pest prevalence will potentially be exceeded and therefore avert suspension.

8. Corrective Action Plans

A corrective action plan for the FF-ALPP should be applied by the NPPO when the population level of the target fruit fly exceeds the specified level of low pest prevalence.

8.1 Preparation of the corrective action plan

Faults in the phytosanitary procedures or their application (e.g., inadequate trapping or pest control measures, inadequate documentation) or the detection of a population level exceeding the specified level of low pest prevalence for the target fruit fly species in the FF-ALPP should trigger the implementation of a corrective action plan. The objective of the corrective action plan is to ensure procedures and their applications are adequate and suppression of the fruit fly population to below the specified level for low pest prevalence is achieved as soon as possible. It is the responsibility of the NPPO to ensure that appropriate corrective action plans are

developed. Corrective action plans should not be repeatedly implemented because this may lead to a revocation of FF-ALPP status and the need to re-establish the area in accordance with the guidance in this annex.

The corrective action plan should be prepared taking into account the biology of the target fruit fly species, the geography of the FF-ALPP, climatic conditions, phenology, and host abundance and distribution within the area.

The elements required for implementation of a corrective action plan include:

- a declaration of suspension of FF-ALPP of status, where appropriate
- a legal framework under which the corrective action plan can be applied
- time frames for the initial response and follow-up activities
- a delimiting survey (trapping and fruit sampling) and application of the suppression actions
- identification capability
- availability of sufficient operational resources
- effective communication within the NPPO and with the NPPO(s) of the relevant importing country(ies), including provision of contact details of all parties involved
- a detailed map and definition of the suspension area
- revision and rectification of operational procedures
- a range of control measures (e.g., pesticides).

8.2 Implementation of the corrective action plan

8.2.1 Notice to implement corrective actions

The NPPO notifies interested stakeholders and parties, including relevant importing countries, when initiating the implementation of a corrective action plan. The NPPO is responsible for supervising the implementation of corrective measures.

Notification should include the reason for initiating the implementation of the plan, that is, faulty procedures found or the specified level of low pest prevalence exceeded.

8.2.2 Determination of the pest status

Immediately after detecting a population level higher than the specified level of low pest prevalence, a delimiting survey (which may include the deployment of additional traps, fruit sampling of host fruits and increased trap inspection frequency) should be carried out to determine the size of the affected area and more precisely gauge the level of the fruit fly prevalence.

8.2.3 Suspension of FF-ALPP status

If the specified level of low pest prevalence of the target fruit fly species is exceeded or faulty procedures are found, the FF-ALPP status should be suspended as stated in section 9.1 of this annex.

8.2.4 Rectification of procedural faults

Faulty procedures and associated documentation should be immediately reviewed to identify the source of the fault(s). The source and corrective action taken should be documented and the modified procedures monitored to ensure compliance with the objectives of the FF-ALPP.

8.2.5 Implementation of control measures in the affected area

Specific suppression actions should immediately be implemented in the affected area(s). Available methods include:

- selective insecticide bait treatments (aerial and/or ground spraying and bait stations)
- SIT
- male annihilation technique
- collection and destruction of affected fruit
- stripping and destruction of host fruits, if possible
- insecticide treatments (ground, cover).

8.2.6 Notification of relevant agencies

Relevant NPPOs and other agencies should be kept informed of corrective actions. Information on pest reporting requirements under the IPPC is provided in ISPM 17 (*Pest reporting*).

9. Suspension, Reinstatement and Revocation of an FF-ALPP status

9.1 Suspension

If the specified level of low pest prevalence of the target fruit fly species is exceeded either throughout the whole FF-ALPP or within a part of the FF-ALPP, the entire FF-ALPP is normally suspended. However, where the affected area within the FF-ALPP can be identified and clearly delimited, then the FF-ALPP may be redefined to suspend only that area.

Relevant importing NPPOs should be notified without undue delay of these actions (further information on pest reporting requirements is provided in ISPM 17).

Suspension may also apply if faults in the application of the procedures are found (e.g., inadequate trapping, pest control measures or documentation).

If an FF-ALPP is suspended, an investigation by the NPPO should be initiated to determine the cause of the failure and introduce measures to prevent such failures from reoccurring.

When an FF-ALPP is suspended, the criteria for reinstatement should be made clear.

9.2 Reinstatement

Reinstatement of FF-ALPP status applies only to suspended areas and may take place when one or both of these criteria have been met:

- the population level no longer exceeds the specified level of low pest prevalence and this is maintained for a period determined by the biology of the target fruit fly species and the prevailing environmental conditions
- faulty procedures have been corrected and verified.

Once the specified level of low pest prevalence has been achieved and maintained and/or procedural faults have been rectified through the application of corrective actions contained in the plan, the FFALPP status can be reinstated. If the FF-ALPP is established for export of host fruits, records regarding the reinstatement should be made available to the NPPO(s) of the relevant importing country(ies) on request and verification may take place if necessary.

9.3 Revocation

The FF-ALPP status should be revoked after suspension if reinstatement has failed to take place within a justifiable time frame, taking into account the biology of the fruit fly target species.

Relevant importing NPPOs should be notified without undue delay of the change in status of the FF-ALPP (further information on pest reporting requirements is provided in ISPM 17).

In the event that FF-ALPP status is revoked, the procedures for establishment and maintenance outlined in this annex should be followed to achieve the FF-ALPP status again, and should take into account all background information related to the area.

This appendix is for reference purposes only and is not a prescriptive part of the annex.

APPENDIX 1 OF ANNEX 1: Typical applications of an FF-ALPP

1. FF-ALPP as Buffer Zones

In cases where the biology of the target fruit fly species is such that it is likely to disperse from an infested area into a protected area, it may be necessary to define a buffer zone with a low fruit fly prevalence (as described in ISPM 26). Establishment of the FF-ALPP and FF-PFA should occur at the same time, enabling the FF-ALPP to be defined for the purpose of protecting the FF-PFA.

1.1 Determination of an FF-ALPP as a buffer zone

Determination procedures draw upon those listed in section 2 of Annex 1. In addition, in delimiting the buffer zone, detailed maps may be included showing the boundaries of the area to be protected, the distribution of hosts, host location, urban areas, entry points and control checkpoints. It is also relevant to include data related to natural biogeographical features such as incidence of other hosts, climate, and location of valleys, plains, deserts, rivers, lakes and sea, as well as other areas that function as natural barriers. The size of the buffer zone in relation to the size of the area being protected will depend on the biology of the target fruit fly species (including behaviour, reproduction and dispersal capacity), the intrinsic characteristics of the protected area, and the economic and operational feasibility of establishing the FF-ALPP.

1.2 Establishment of an FF-ALPP as a buffer zone

The establishment procedures are described in section 5 of Annex 1. The movement of relevant fruit fly host commodities into the area may need to be regulated. Additional information can be found in ISPM 26.

1.3 Maintenance of an FF-ALPP as a buffer zone

Maintenance procedures include those listed in section 7 of Annex 1. Because the buffer zone has features similar to the area or place of production it protects, procedures for maintenance may include those listed for the FF-PFA as described in ISPM 26 and ISPM 22. The importance of information dissemination may also be considered in the maintenance of an FF-ALPP as a buffer zone.

2. FF-ALPPs for Export Purposes

FF-ALPPs may be used to facilitate fruit exports from the area. In most cases the FF-ALPP is the main component of a systems approach as a pest risk mitigation measure. Examples of measures and/or factors used in conjunction with FF-ALPPs include:

- pre- and post-harvest treatments
- production of secondary hosts or non-hosts in preference to primary hosts
- export of host material to areas not at risk during particular seasons
- physical barriers (e.g., pre-harvest bagging, insect-proof structures).

2.1 Determination of an FF-ALPP for export purposes

Determining procedures may include those listed in section 2 of Annex 1. In addition, the following elements should be considered for the determination of an FF-ALPP:

- products (hosts) of interest
- other commercial and non-commercial hosts of the target fruit fly species present but not intended for export and their level of occurrence, as appropriate
- historical records in connection with biology, occurrence and control of the target fruit fly species or any other fruit fly species that may be present in the FF-ALPP, and any other information, as appropriate.

2.2 Maintenance of an FF-ALPP for export purposes

Maintenance procedures may include those described in section 7.2 of Annex 1 and should be applied if hosts are available. If appropriate, surveillance may continue at a lower frequency during the offseason period. The frequency will depend on the biology of the target fruit fly species and its relationship with hosts present during the off-season period.

This annex is a prescriptive part of the standard.

ANNEX 2: Parameters used to estimate the level of fruit fly prevalence

Parameters used to determine the level of fruit fly prevalence in the FF-ALPP are defined by the NPPO. The most widely used parameter is flies per trap per day (FTD). More precise spatial data may be presented on the basis of trap density (i.e., FTD per unit area) or temporally for each trap present in an area over time.

FTD is an index used to estimate the population by averaging the number of flies captured by one trap in one day. This parameter estimates the relative number of fruit fly adults in a given time and space. It provides baseline information to compare fruit fly populations among different places and/or time.

The FTD index is the result of dividing the total number of captured flies (F) by the product obtained from multiplying the total number of inspected traps (T) by the average number of days the traps were exposed in the field (D). The formula is as follows:

$$FTD = \frac{F}{T \times D}$$

In cases where traps are regularly inspected on a weekly basis, or longer in the case of winter surveillance operations, the parameter may be "flies per trap per week" (FTW). FTW estimates the number of flies captured by one trap in one week. FTD can be obtained from FTW by dividing by seven. Any significant changes in the status of any parameters critical to the efficacy of the FF-ALPP should be reviewed and modified, as appropriate.

Specified levels of low pest prevalence, as expressed in FTD values, should be established in relation to the risk of infestation of the fruits that are intended to be protected by the FF-ALPP, and in relation to any specific related objectives of the FF-ALPP (e.g., fruit-fly free commodities for export). In situations where a single FF-ALPP contains more than one host species (i.e., the ALPP is intended to protect more than one target fruit fly host), the specified level of low pest prevalence should be based on scientific information relating to each host of the fruit fly species, and the risks of infestation and comparative preferences of the target fruit fly species for the different hosts. However, in situations where the FF-ALPP is established to protect only one type of host, consideration should be given to the level of infestation expected on that host. In such situations, lower specified levels of low pest prevalence are usually established for the primary hosts of the target fruit fly species and comparatively higher levels for secondary hosts.

The biology of the target fruit flies (including number of generations per year, host range, host species present in the area, temperature thresholds, behaviour, reproduction and dispersion capacity) plays a major role in establishing appropriate specified levels of low pest prevalence. For an FF-ALPP with several hosts present, the established specified levels of low pest prevalence should reflect host diversity and abundance, host preference and host sequence for each target fruit fly species present. Although an FF-ALPP may have different specified levels of low pest prevalence for each relevant fruit fly target species, those levels should remain fixed for the whole area and duration of the FF-ALPP operation.

The efficiency of the types of traps and attractants used to estimate the levels of the pest population and the procedures applied for servicing the traps should be taken into consideration. The rationale is that different trap efficiencies could lead to different FTD results at the same location for a given population, so they have a significant effect on measuring the prevalence level of the target fruit fly species. Thus, when specifying the level of low pest prevalence accepted in terms of an FTD value, the efficacy of the trapping system should be stated as well.

Once a specified level of low pest prevalence has been established for a given situation using a specific lure or attractant, the lure or attractant used in the FF-ALPP must not be changed or modified until an appropriate specified level of low pest prevalence is determined for the new formulation. For FF-ALPPs with multiple target fruit fly species present that are attracted to different lures/attractants, trap placement should take into consideration possible interactive effects between them.

Fruit sampling can be used as a complementary surveillance method to trapping to assess the profile of the fruit fly population levels, particularly if traps are not available for target species. Fruit sampling should be done on known hosts. It should be taken into account that efficacy of fruit sampling depends on sample size, frequency and timing. Fruit sampling may include rearing larvae to identify the fruit fly species. If fruit cutting is done, the efficacy of visually detecting larvae should be considered. However, fruit sampling will not provide sufficient accuracy for describing the size of the population and should not be solely relied on to validate or verify the FF-ALPP status.

Dominica Bureau of Standards

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