EPPO's Recommendations, Standards and Information on Fruit Flies

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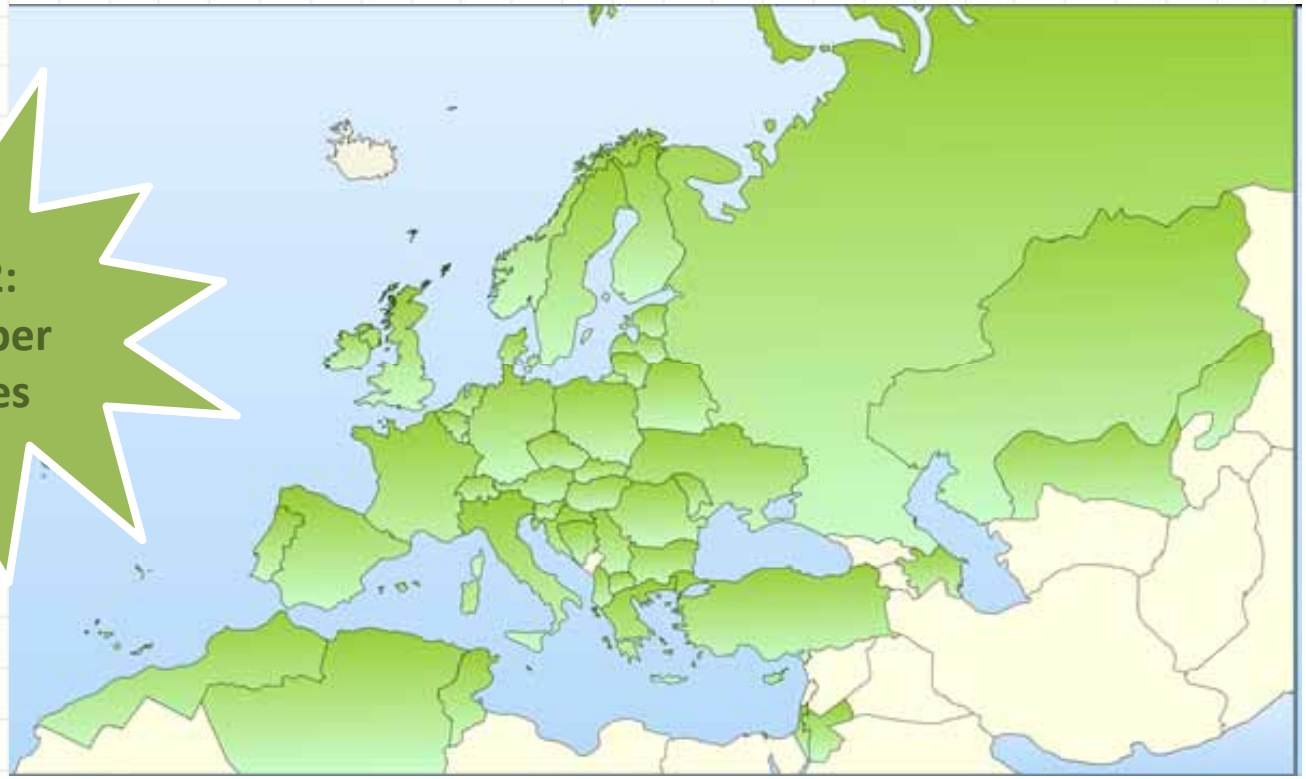
EPPO Assitant Director

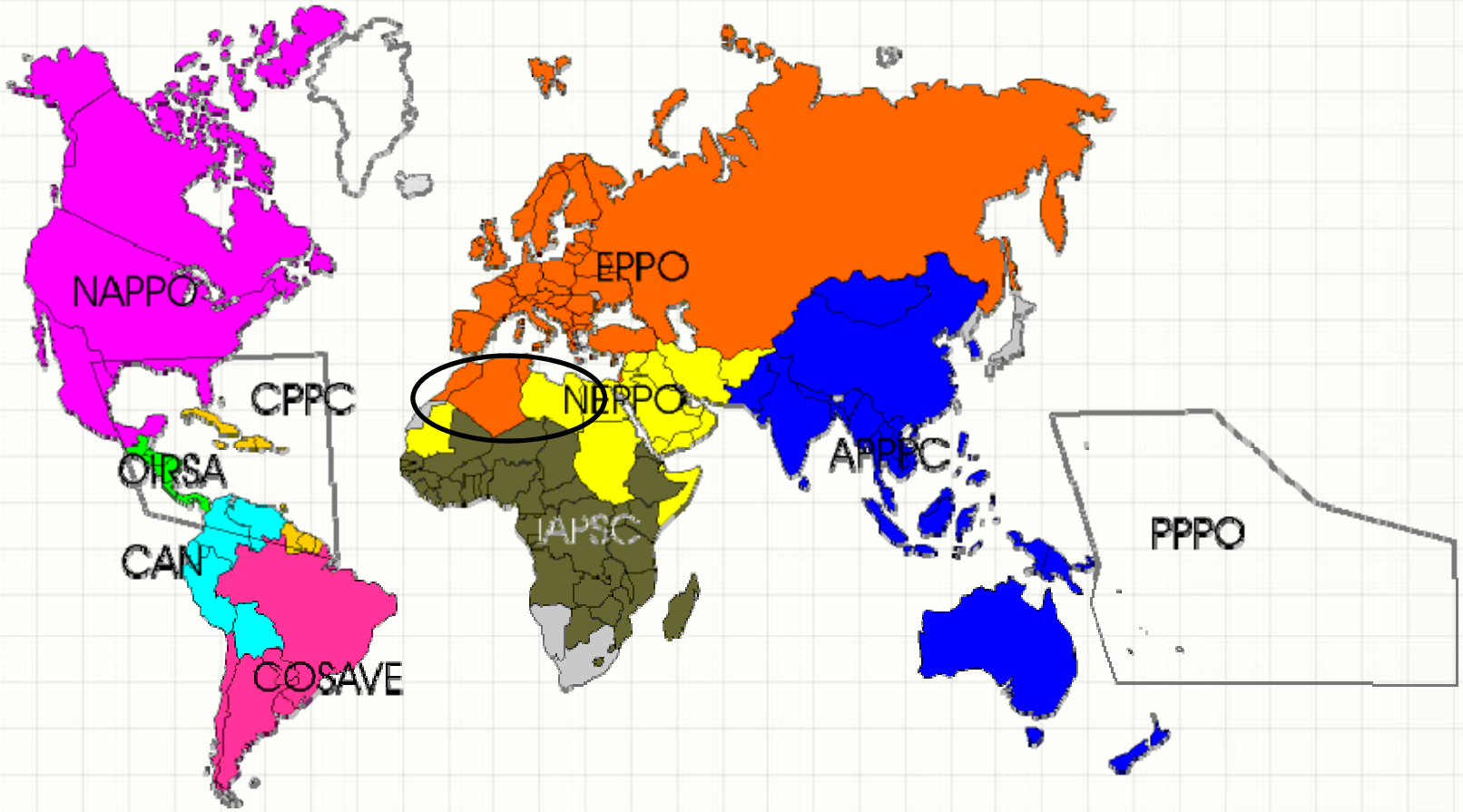
European and Mediterranean Plant Protection Organization

- **Regional Plant Protection Organization (article IX of the IPPC)**
- **Creation 1951 by 15 countries**
- **International cooperation in plant protection (plant quarantine and plant protection products)**

In 2012:
50 member countries



Regional Plant Protection Organizations



International Plant Protection Convention
Protecting the world's plant resources from pests

EPPO and the European Union

27 EU members are all EPPO members

EU prepares regulations

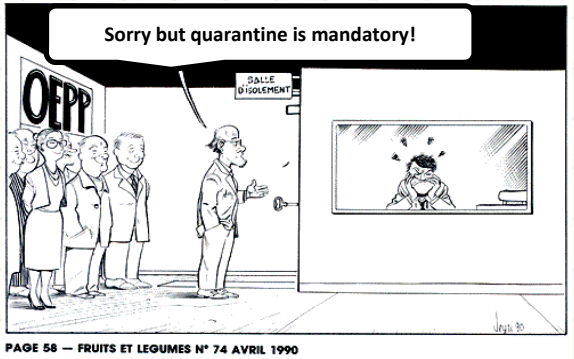
EPPO makes recommendations

e.g. regional standards

EPPO: two main areas of activities

- **Plant quarantine**

  Prevent entry or spread of dangerous pests



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- **Plant protection products**

  Promotion of the use of modern, safe and effective pest control methods.

PLANT QUARANTINE

Plant Quarantine: EPPO's missions

Prevent entry and spread of pests (crops, forests, natural environments)

- Provide information to EPPO members
- Identify potential risks: Early warning systems to identify emerging risks
- Evaluate potential risks: Pest Risk Analysis (possible outcome is a recommendation on pests which should be regulated as quarantine pests EPPO A1 and A2 Lists)
- Preparation of standards (e.g. official control standards, diagnostic protocols, inspection procedures….)

INFORMATION TO EPPO MEMBERS AND EARLY WARNING FOR EMERGING PEST

Data collection to provide information to its members

- ***"Traditional" data collection***

Peer-reviewed journals, CAB Plant Protection Database, National journals, Conference proceedings, Books

- ***Official information (NPPOs)***

- ***Internet data collection***

NAPPO Alert List, ProMED, EPICA…

Over 100 publications reviewed!

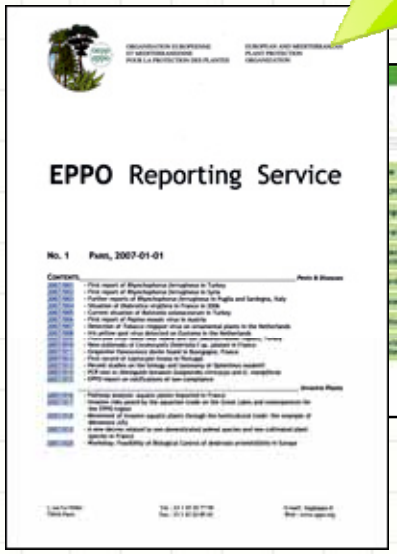
Low tech, hard work!

Storage and dissemination of information on pests

Data collection

Insects and mites			
Acleris gloverana	ds	-	pict
Acleris variana	ds	-	pict
Agrilus anxius	ds	-	-
Aleurocanthus woglumi	ds	diag	pict
Anastrepha fraterculus	ds	-	-
Anastrepha ludens	ds	-	pict
Anastrepha obliqua	ds	-	-
Anastrepha suspensa	ds	-	-
Anoplophora glabripennis	ds	-	-
Anthonomus bisignifer	ds	-	-
Anthonomus eugenii	ds	-	-
Anthonomus grandis	ds	-	pict
Anthonomus signatus	ds	-	-
Arrhenodes minutus (as a putative vector of Ceratocystis fagacearum)	ds	-	-
cockerelli (as a vector of Liberibacter solanacearum)	(ds)	-	-
cucumis	ds	-	-
cucurbitae	ds	-	-

EPPO datasheets



EPPO Reporting Service

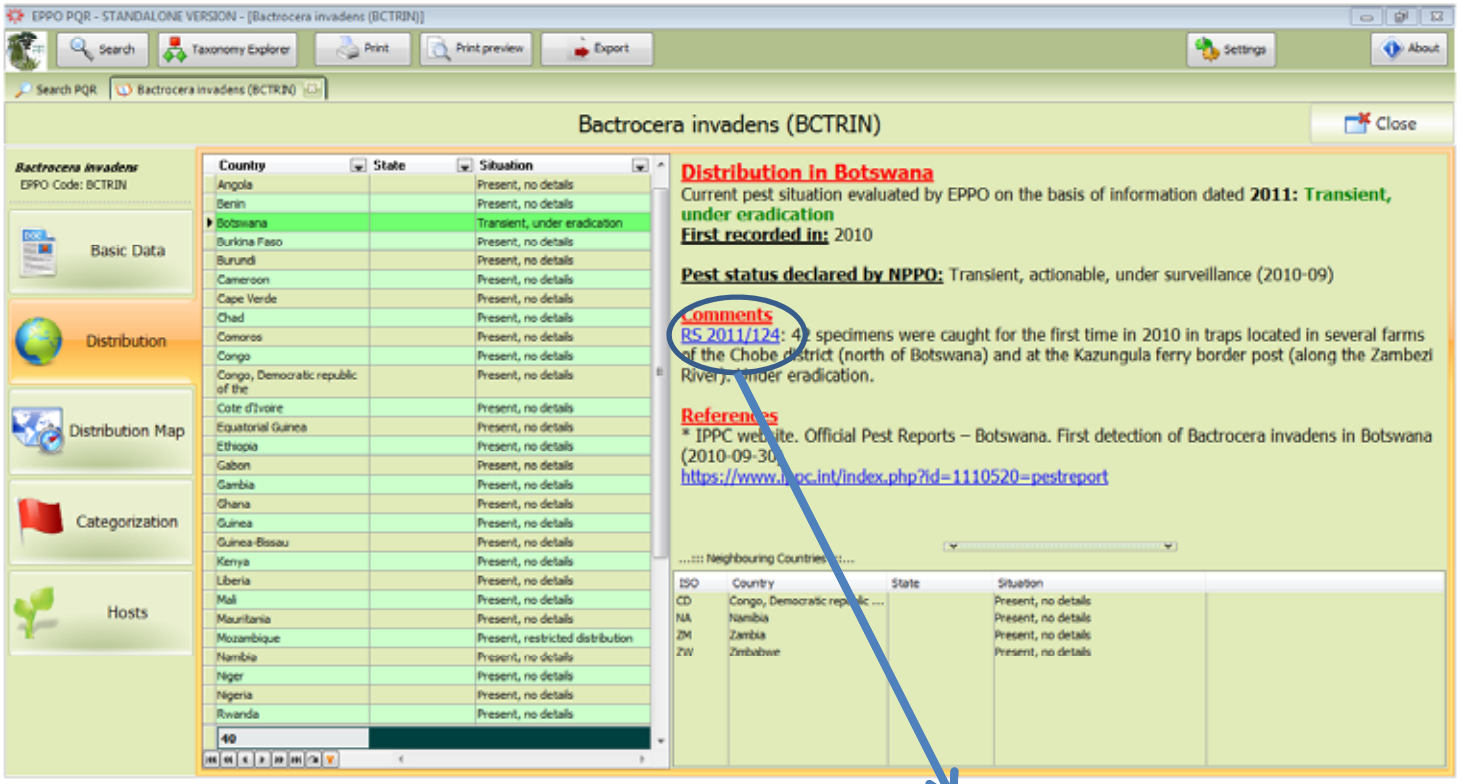
No. 1 Paris, 2007-01-01

EPPO Alert List

Stored data

http://www.eppo.org/

PQR EPPO database on pests



Data on distribution of pests

2011/214 First report of *Bactrocera invadens* in Botswana

In 2010, the presence of *Bactrocera invadens* (Diptera: Tephritidae - EPPO A1 List) was detected for the first time in Botswana. 42 specimens were caught in traps (baited with cuelure and methyl-eugenol) which were located in several farms of the Chobe district (north of Botswana) and also at the Kazungula ferry border post (Zambezi River, adjacent to the borders with Namibia and Zimbabwe). Phytosanitary measures were taken and included: 1) a delimiting survey; 2) eradication procedures; 3) tracing-back studies to identify the source of infestation and try to prevent any further re-infestation; 4) prohibition to move host fruits from delimited areas.
The pest status of *Bactrocera invadens* in Botswana is officially declared as: **Transient, actionable, under surveillance.**

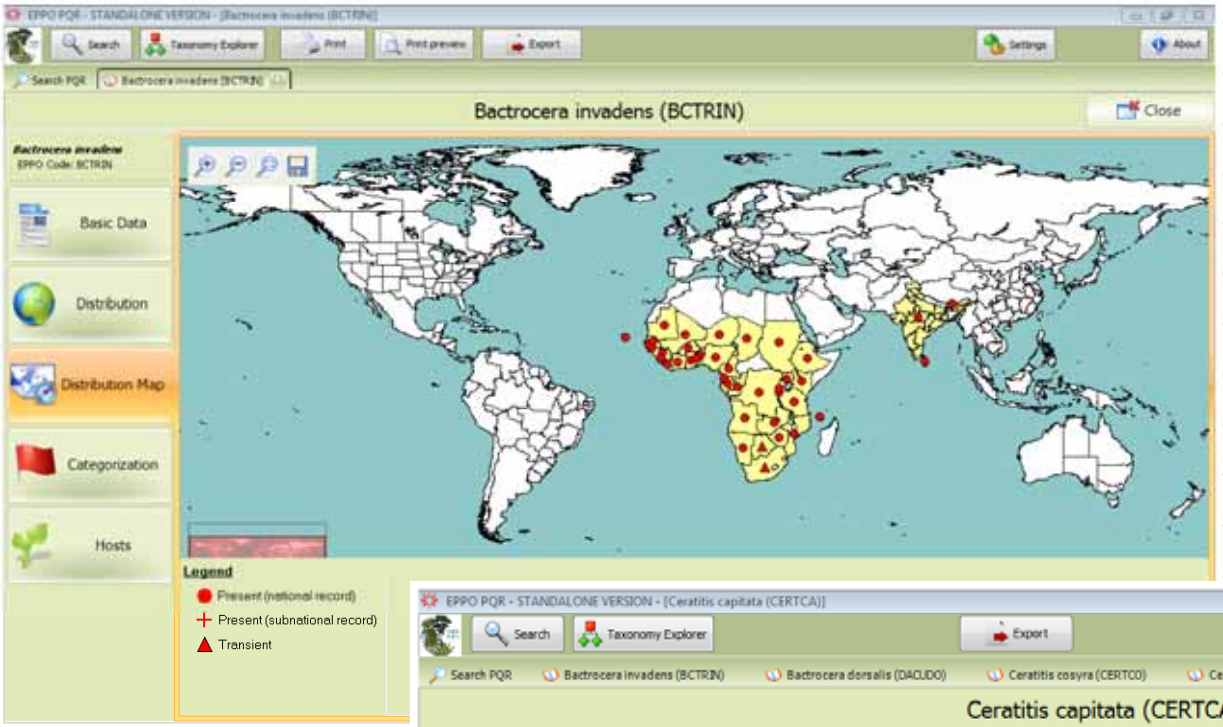
Source: IPPC website. Official Pest Reports - Botswana. First detection of *Bactrocera invadens* in Botswana (2010-09-30)
https://www.ippc.int/index.php?id=1110520&type=pestreport

Additional key words: new record

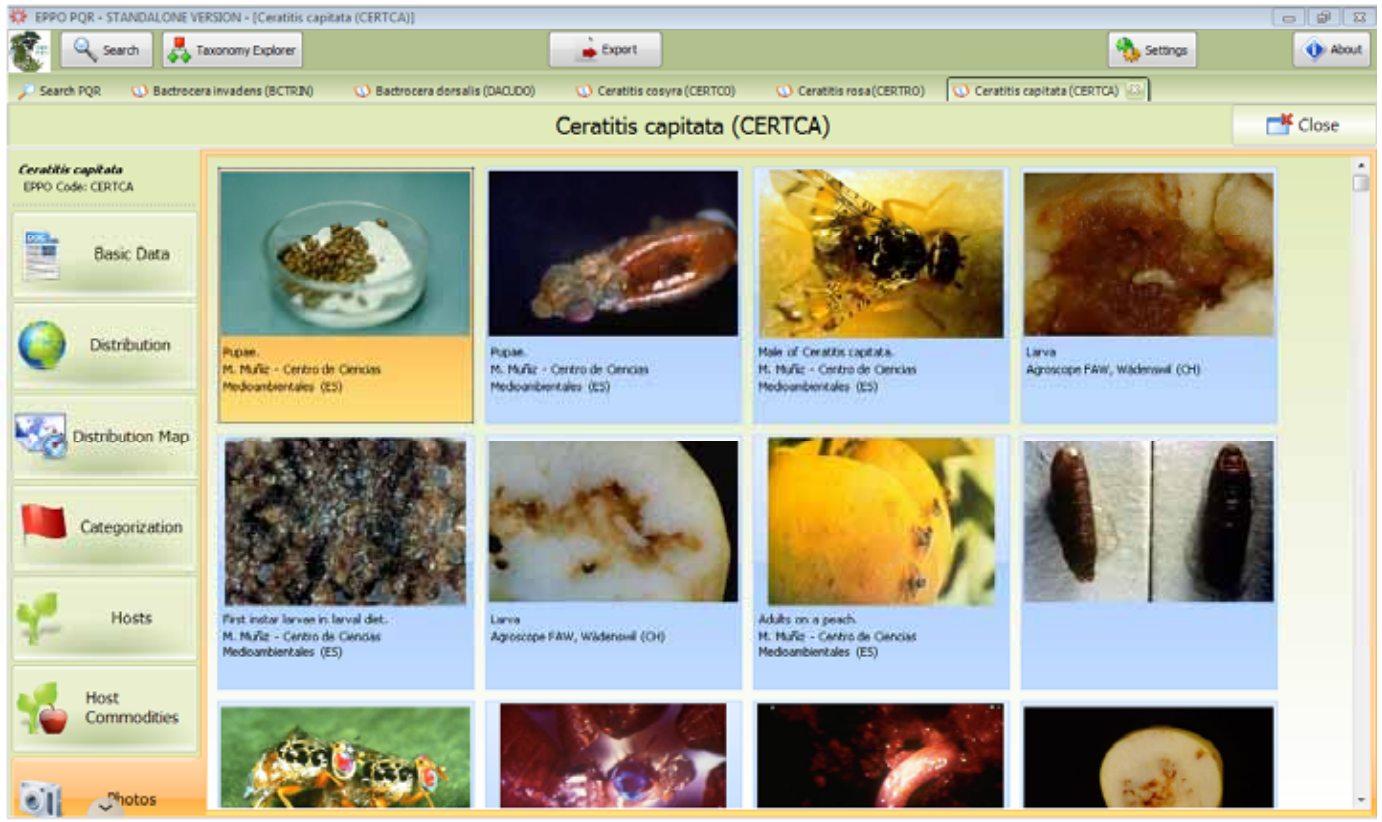
Computer codes: BCTRIN, BW

PQR

Maps



Photos



Future: online database

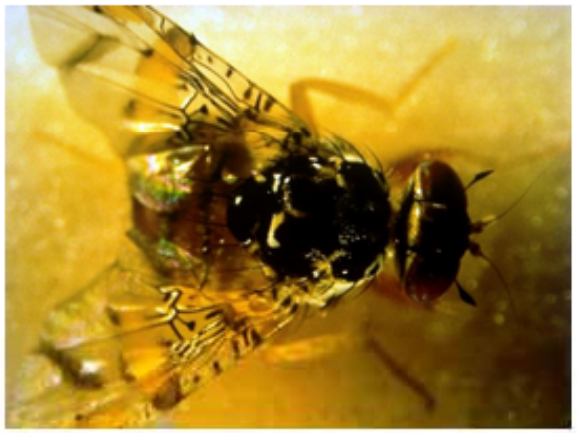
What is Global Database? | Help | Login

EPPO Global Database *(beta)*

Search... GO

Ceratitis capitata (CERTCA)

Overview | Distribution | Distribution map | Hosts | Pathways Hosts | Categorization | Reporting | Photos | Documents



Male of Ceratitis capitata.
M. Muñiz - Centro de Ciencias Medioambientales (ES)




see all photos

Basic information

EPPO Code: CERTCA
Preferred name: Ceratitis capitata
Author(s): (Wiedemann)

Taxonomy

| Animalia (1ANIMK)
|--- Arthropoda (1ARTHP)
|------ Hexapoda (1HEXAQ)
|--------- Insecta (1INSEC)
|------------ Diptera (1DIPTO)
|--------------- Tephritidae (1TEPHF)
|----------------- Ceratitis (1CERTG)
|---------------------- Ceratitis capitata (CERTCA)

Other scientific names

Name	Author(s)
Ceratitis citriperda	Macleay
Ceratitis hispanica	de Breme
Pardalaspis asparagi	Bezzi
Tephritis capitata	Wiedemann

Early warning: the EPPO Alert List

- Initiated in 1999
- Provides early warning
- Suggests possible candidates for Pest Risk Analysis

- Critically reviewed every year (when alert has been given and no further action taken, pests are deleted after 3 years on the list)
- Freely available on the EPPO website: www.eppo.org

EPPO Alert List

http://www.eppo.int/QUARANTINE/Alert_List/alert_list.htm

Strauzia longipennis

Diptera: Tephritidae - Sunflower maggot

Why: An isolated finding of *Strauzia longipennis*, a North American pest of sunflowers, was first reported in 2010 from Germany. Considering the importance of sunflower (*Helianthus annuus*) cultivation in the EPPO region, the German NPPO suggested that *S. longipennis* should be added to the EPPO Alert List.

Where: *S. longipennis* is a North American species which had not been reported outside its native area, so far.
EPPO region: Germany (first incursions detected in 2010 in Berlin - in 2011, *S. longipennis* was was found at several locations in the urban area of Berlin and in 27 sunflower fields in Brandenburg).
North America: Canada (Alberta, Manitoba, Ontario, and possibly other provinces), USA (Arizona, California, Colorado, Connecticut, Florida (not established), Idaho, Illinois, Indiana, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, South Dakota, Texas, Utah, Virginia, Wisconsin).

Strauzia longipennis
Frank Peairs (Colorado State University, US)
bugwood.org

www.eppo.org

It provides information on:

- distribution,
- host plants,
- biology,
- damage,
- transmission,
- pathway,
- possible risks

Previously on the Alert List:

***Bactrocera invadens* (A1 list in 2010)**

***Drosophila suzukii* (A2 list in 2011)**

PEST RISK ANALYSIS

Potential pests: PRA & phytosanitary regulations

- When new pests are emerging, studies can be done to evaluate whether phytosanitary regulations are appropriate to prevent introduction and spread

- Pest Risk Analysis can be performed

Risk perception | Risk assessment | Risk management

Performing and reviewing PRA to recommend regulation of pests

Any request for addition to the EPPO Lists should be supported by a PRA

PRAs prepared by EPPO member countries

PRAs performed by an EPPO Expert Working Group for PRA

PRAs are reviewed by EPPO Panels and pests are eventually added to the EPPO A1/A2 Lists with recommendations on management options (phytosanitary measures)

EPPO recommendations may serve as a basis for establishing the EPPO member countries regulations on plant health.

Information on pests recommended for regulations are available on the EPPO Website:
http://www.eppo.int/QUARANTINE/quarantine.htm

PRA for *Bactrocera invadens* conducted in 2009

Expert Working Group convened with experts on fruit flies (e.g. De Meyer Marc , Quilici Serge, Vayssieres Jean-François) and PRA experts.

Conclusion the evaluation:

Highly polyphagous pest with potential for high impact

Major hosts in the EPPO region: *Mangifera indica, Citrus* spp., *Psidium guajava,* and *Carica papaya.*

The endangered area includes Algeria, Egypt, Jordan, Israel, Libya, Morocco, and Tunisia.

In other Mediterranean countries, occurrence of local transient populations is possible

Uncertainty on limiting factors such as cold and drought resistance and ability to establish in temperate areas

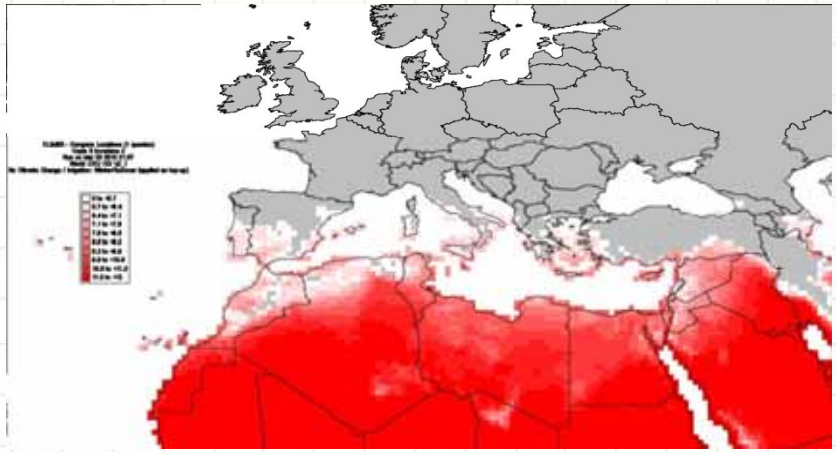


Figure 3: Number of generations of *B. invadens* superior to 5 in the Mediterranean Basin, with irrigation scenario

Pest recommended for addition to the A1 List in 2010

PRA information is available on the EPPO website http://www.eppo.int/QUARANTINE/Pest_Risk_Analysis/PRA_intro.htm

po.int/QUARANTINE/Pest_Risk_Analysis/PRA_intro.htm

Diagnostic C... EPPO - EPPT - Searc... EPPO Extranet Webmail google Diagnostic activities ... Pest risk analysis | Sc... Q-Bank main

PRAs conducted by EPPO Expert Working Groups

Since 2006, EPPO organizes meetings of Experts Working Groups which are conducting PRAs on specific pests following the EPPO Decision-support scheme and its computerized version CAPRA (see above). The conclusions resulting from these PRAs are addressed to the EPPO member countries only (the area potentially at risk that is considered during these PRAs is the EPPO region, not the other parts of the world).

- ***Finalized PRAs***

Pest	PRA Documents	Data sheets	Final decision
Insects and mites			
Agrilus anxius	PRA (11-16987) - PRA rep (11-16988)	Final DS	A1 - 2011
Aulacaspis yasumatsui	PRA (08-14021) - PRA rep (08-14022)	-	Not added
Bactrocera invadens	PRA (10-16103) - PRA rep (10-16120)	-	A1 - 2010
Diocalandra frumenti	PRA (11-16940) - PRA rep (11-16939)	Draft DS (10-15862)	Not added
Drosophila suzukii	PRA (11-17189) - PRA rep (11-17190)		A2 - 2011
Epitrix spp.	PRA (11-17790) - PRA rep (11-17791)	-	A1/A2 - 2010
Megaplatypus mutatus	PRA (07-13322) - PRA rep (07-13558)	Final DS	A2 - 2007
Metamasius hemipterus	PRA (09-15223) - PRA rep (09-15446)	Draft DS (09-15171)	A1 - 2009
Raoiella indica	PRA (08-14675) - PRA rep (09-15197)	-	Not added
Saperda candida	PRA (11-16589) - PRA rep (10-16044)	-	A1 - 2010
Tetranychus evansi	PRA (08-14559) - PRA rep (08-14562)	Draft DS (07-13924)	A2 - 2008
Nematodes			
Bursaphelenchus xylophilus	PRA (09-15449) - PRA rep (09-15450)	Final DS	A1
Meloidogyne enterolobii	PRA (10-16243) - PRA rep (10-16246)	-	A2 - 2010
Fungi (and fungus-like)			
Phytophthora lateralis	PRA (06-12730) - PRA rep (06-12731)	Final DS	A1 - 2006

STANDARDS

Development of EPPO Standards

To help its member countries EPPO has developed Standards on:

- Diagnostic protocols
- Eradication /containment programmes

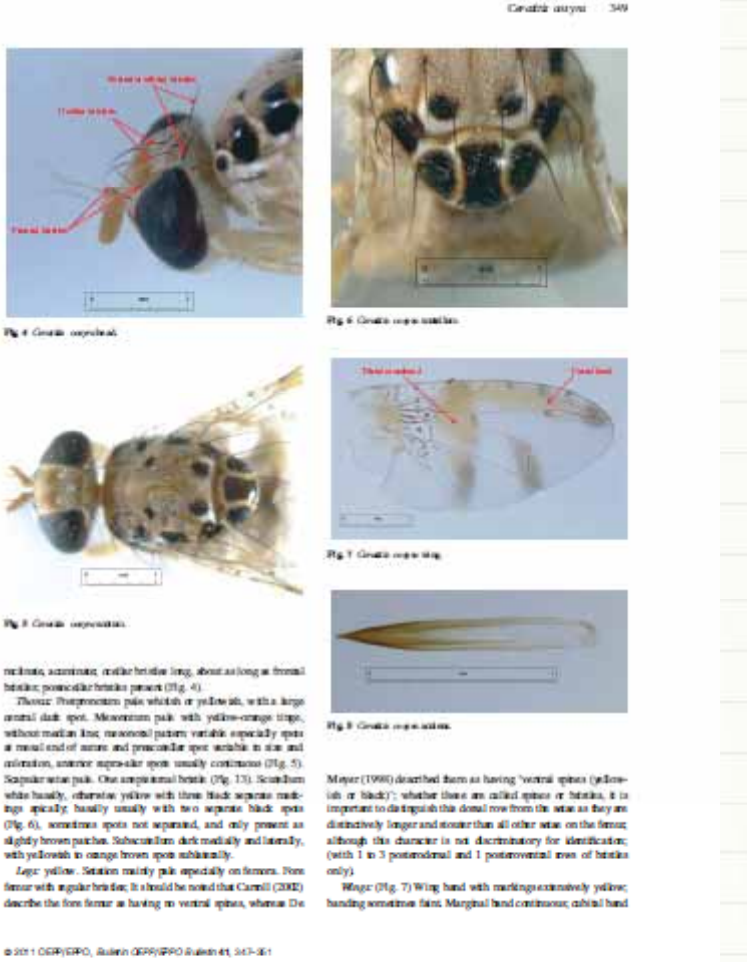
- Inspection

Recommendations on how to detect and identify pests:

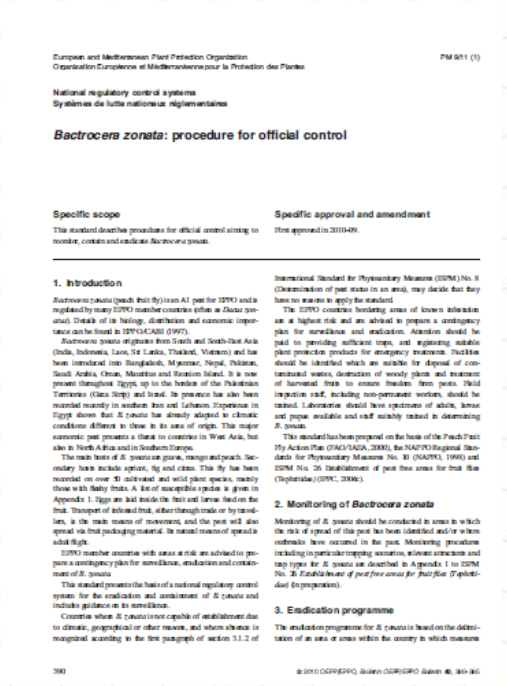
EPPO Diagnostic Protocols (series PM7)

http://archives.eppo.int/EPPOStandards/diagnostics.htm

PM 7/104(1)	*Ceratitis capitata*
PM 7/105(1)	*Ceratitis cosyra*
PM 7/106(1)	*Sternochetus mangiferae*
PM 7/107(1)	*Rhagoletis completa*
PM 7/108(1)	*Paysandisia archon*
PM 7/109(1)	*Epitrix cucumeris*, *E. similaris* and *E. tuberis*



Recommendations on how to eradicate or control pests : National Regulatory Control Systems (series PM9)



European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

PM 9/11 (1)

National regulatory control systems
Systèmes de lutte nationaux réglementaires

Bactrocera zonata: procedure for official control

Specific scope

This standard describes procedures for official control aiming to monitor, contain and eradicate *Bactrocera zonata*.

Specific approval and amendment

First approved in 2010-09.

1. Introduction

Bactrocera zonata (peach fruit fly) is an A1 pest for EPPO and is regulated by many EPPO member countries (often as *Dacus zonatus*). Details of its biology, distribution and economic importance can be found in EPPO/CABI (1997).

Bactrocera zonata originates from South and South-East Asia (India, Indonesia, Laos, Sri Lanka, Thailand, Vietnam) and has been introduced into Bangladesh, Myanmar, Nepal, Pakistan, Saudi Arabia, Oman, Mauritius and Reunion Island. It is now present throughout Egypt, up to the borders of the Palestinian Territories (Gaza Strip) and Israel. Its presence has also been recorded recently in southern Iran and Lebanon. Experience in Egypt shows that *B. zonata* has already adapted to climatic conditions different to those in its area of origin. This major economic pest presents a threat to countries in West Asia, but also in North Africa and in Southern Europe.

The main hosts of *B. zonata* are guava, mango and peach. Secondary hosts include apricot, fig and citrus. This fly has been recorded on over 70 cultivated and wild plant species, mainly those with fleshy fruits. A list of susceptible species is given in Appendix 1. Eggs are laid inside the fruit and larvae feed on the fruit. Transport of infested fruit, either through trade or by travellers, is the main means of movement, and the pest will also spread via fruit packaging material. Its natural means of spread is adult flight.

EPPO member countries with areas at risk are advised to prepare a contingency plan for surveillance, eradication and containment of *B. zonata*.

This standard presents the basis of a national regulatory control system for the eradication and containment of *B. zonata* and includes guidance on its surveillance.

Countries where *B. zonata* is not capable of establishment due to climatic, geographical or other reasons, and where absence is recognized according to the first paragraph of section 3.1.2 of International Standard for Phytosanitary Measures (ISPM) No. 8 (Determination of pest status in an area), may decide that they have no reasons to apply the standard.

The EPPO countries bordering areas of known infestation are at highest risk and are advised to prepare a contingency plan for surveillance and eradication. Attention should be paid to providing sufficient traps, and registering suitable plant protection products for emergency treatments. Facilities should be identified which are suitable for disposal of contaminated wastes, destruction of woody plants and treatment of harvested fruits to ensure freedom from pests. Field inspection staff, including non-permanent workers, should be trained. Laboratories should have specimens of adults, larvae and pupae available and staff suitably trained in determining *B. zonata*.

This standard has been prepared on the basis of the Peach Fruit Fly Action Plan (FAO/IAEA, 2000), the NAPPO Regional Standards for Phytosanitary Measures No. 10 (NAPPO, 1998) and ISPM No. 26 Establishment of pest free areas for fruit flies (Tephritidae) (EPPO, 2006).

2. Monitoring of _Bactrocera zonata_

Monitoring of *B. zonata* should be conducted in areas in which the risk of spread of this pest has been identified and/or where outbreaks have occurred in the past. Monitoring procedures including in particular trapping scenarios, relevant attractants and trap types for *B. zonata* are described in Appendix 1 to ISPM No. 26 *Establishment of pest free areas for fruit flies (Tephritidae)* (in preparation).

3. Eradication programme

The eradication programme for *B. zonata* is based on the delimitation of an area or areas within the country in which measures

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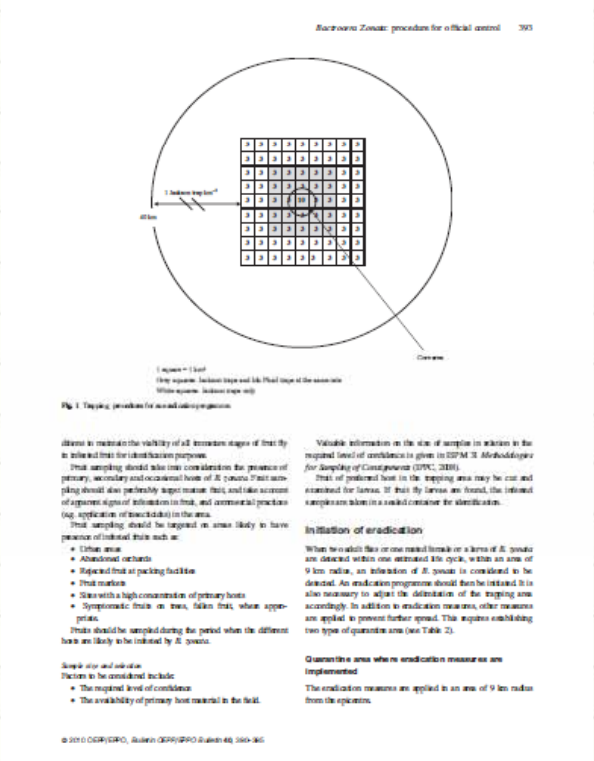


Bactrocera Zonata: procedure for official control 393

Fig. 1. Trapping procedure for normal delimiting operations.

dilemi to maintain the viability of all immature stages of fruit fly in infested fruit for identification purposes.

Fruit sampling should take into consideration the presence of primary, secondary and occasional hosts of *B. zonata*. Fruit sampling should also particularly target mature fruit, and take account of apparent signs of infestation in fruit, and commercial practices (eg. application of insecticides) in the area.

Fruit sampling should be targeted on areas likely to have presence of infested fruits such as:

- Urban areas
- Abandoned orchards
- Rejected fruit at packing facilities
- Fruit markets
- Sites with a high concentration of primary hosts
- Symptomatic fruits on trees, fallen fruit, where appropriate.

Fruits should be sampled during the period when the different hosts are likely to be infested by *B. zonata*.

Sample size and selection

Factors to be considered include:

- The required level of confidence
- The availability of primary host material in the field.

Valuable information on the size of samples in relation to the required level of confidence is given in ISPM 31 *Methodologies for Sampling of Consignments* (IPPC, 2008).

Fruit of preferred host in the trapping area may be cut and examined for larvae. If fruit fly larvae are found, the infested samples are taken in a sealed container for identification.

Initiation of eradication

When two adult flies or one mated female or a larva of *B. zonata* are detected within one estimated life cycle, within an area of 9 km radius, an infestation of *B. zonata* is considered to be detected. An eradication programme should then be initiated. It is also necessary to adjust the delimitation of the trapping area accordingly. In addition to eradication measures, other measures are applied to prevent further spread. This requires establishing two type of quarantine area (see Table 2).

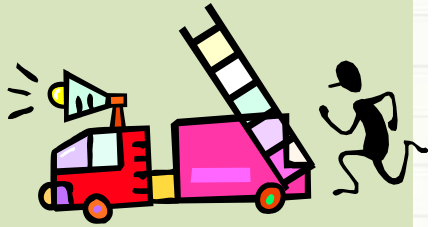
Quarantine areas where eradication measures are implemented

The eradication measures are applied in an area of 9 km radius from the epicentre.

'Generic elements for contingency planning': a rapid and effective response of NPPOs to pest outbreaks (containment/eradication):

- a general framework
- pest specific contingency plans remain to be drafted…

Decision support scheme for eradication (in preparation)



Inspection procedures

- Procedures for consignment inspection and place of production inspection (under reactivation!)




PLANT PROTECTION PRODUCTS

EPPO activities to ensure that principles of good plant protection practice are followed

- Development of Standards (e.g. efficacy evaluation more than 260 Standards, environmental risk assessment, good plant protection practices…)

EPPO database on efficacy evaluation standards: more information direct access: http://pp1.eppo.org

- Organization of conferences and workshops on themes related to plant protection

Currently in PPP activities "Hot topics" include: minor uses, resistance, comparative assessment, zonal recognition…

Specific Standards developed for Fruit Flies

- Standard PP1/35 conduct of trials for the efficacy evaluation of insecticides against *Rhagoletis cerasi* on cherry.
- Standard PP1/106 conduct of trials for the efficacy evaluation of insecticides against *Ceratitis capitata* on fruit trees (bait treatments against low infestations of *Ceratitis capitata* and treatments against normal infestations).
- Standard PP 1/108 *Bactrocera oleae* – canopy spray
- Standard PP1/280 *Bactrocera oleae* – bait application

- Horizontal standards that may be applicable for fruit flies PP 1/264 Mating disruption pheromones

- Standard in preparation

Efficacy evaluation of insecticides against Drosophila suzukii

Future activities related to IPM

- Work to support the regulatory process development of standards:
  - Principles of efficacy evaluation for pheromone based plant protection products
  - Guidance for assessing the impact of plant protection products on beneficial organisms in efficacy trials.

- IPM pilot project to update one of the existing GPP Standards (PP2)
  - Objective
    Establish the feasibility of undertaking a revision of the standards in the series PP2.

EPPO's achievements are based on collaboration between experts from our region.

Thank you for your attention!