Expert Consultation on pHYTOSANITARY treatments for

*The Bactrocera Dorsalis* coMplex

***Concept note***

***Overview***

The Standards Committee (SC) was informed about concerns from some countries on the absence of phytosanitary treatments for the control of *Bactrocera invadens,* Drew, Tsuruta & White (Diptera: Tephritidae)*.* After discussion between the IPPC Secretariat and the National Plant Protection Organization (NPPO) of Japan it was agreed to organize an expert consultation meeting on phytosanitary treatments to control fruit flies of economic importance from the *Bactrocera dorsalis* complexin December 2014 in Okinawa. The Technical Panel on Phytosanitary Treatments (TPPT), the Technical Panel on Fruit Flies (TPFF) and the SC have all agreed such a meeting would be of particular interest to those areas or countries affected by this pest.

The fruit fly *B. invadens* was first detected on the African continent in 2003 (Lux *et al.,* 2003) (1) and was described by Drew *et al.,* in 2005 as a new species (using the African holotype). This pest is believed to be endemic to Sri Lanka (Drew et al 2005). *B. invadens* has been rapidly spreading across Africa and has now expanded throughout most of Sub-Saharan Africa (Grout *et al.,* 2011).

*B. invadens* has been associated with the *B. dorsalis* cryptic species complex which includes pest species such as *B. carambolae*, *B. philippinensis* and *B. papayae*. Recent scientific evidence (Schutze et al. 2012, San Jose et al. 2013) has confirmed the separate species status for *B. carambolae* but it questions the species status of *B. invadens*, *B. papayae* and *B. philippinensis* arguing that they are variants of a sibling species group within the *Bactrocera dorsalis* complex. This group includes species with considerable morphological variation over its geographic distribution from China throughout South-East Asia to India, Pakistan and Sri Lanka. These and ongoing studies may modify the accepted specific status of some current species including *B. invadens* in the near future. In the meantime, it is perceived that phytosanitary treatments in place for other species within the *B. dorsalis* complex can be applied to *B. invadens.* To take this into account,it was agreed to expand the scope of the meeting to be an Expert Consultation on the *B. dorsalis* complex which has a broader meaning and includes, *Bactrocera invadens* together with *B. dorsalis* s.s., *B. papayae*, and *B. philippinensis.*

Currently the IPPC is working on phytosanitary treatments as annexes to ISPM 28 *Phytosanitary treatments for regulated pests* and seeks submissions of National Plant Protection Organization (NPPO) or Regional Plant Protection Organization (RPPO) approved phytosanitary treatments in a number of areas, including treatments for fruit fly. These treatments are evaluated by the TPPT with inputs from all International Plant Protection Convention (IPPC) members during the consultation period.

Collecting the scientific evidence for an NPPO or RPPO to submit a proposed phytosanitary treatment in response to a call by the IPPC Secretariat requires significant effort as submitters try to meet all the requirements prescribed in ISPM 28:2007. Nevertheless some treatments submitted unfortunately do not meet the requirements. In some cases, data are missing and, consequently, the treatment can therefore not be evaluated. In other cases data are presented in many different, non-uniform ways which presents a challenge for the TPPT. To facilitate the submission, evaluation and development of an internationally accepted phytosanitary treatment, and to gain a greater understanding of the global issues, it was agreed to organize an expert consultation. Experts with experience in designing and conducting research on phytosanitary treatment for fruit flies, as well as those involved in confirmatory trials (operational conditions) and treatment submissions are invited to participate in this consultation.

Invited experts would be expected to share an overview of treatments they have developed and through discussion, participants should be able to identify and agree how to address the main issues in the development of *B. dorsalis* complex treatments such as experimental design, statistical analyses, confirmatory trials, treatment evaluation and treatment submission. Also, experts would be expected to present their data and participants will analyse commonalities between data.

To help facilitate this process, experts should also consider the results of the Expert Consultation on Cold Treatments held in 2013 to gain experience in how this group identified global issues affecting the development of phytosanitary cold treatments.

***Scope:*** *Bactrocera invadens, B. dorsalis s.s., B. papayae, and B. philippinensis.*

***Objectives of the meeting are to:***

* *provide a forum for phytosanitary treatments researchers from around the world to discuss and share the scientific and practical issues related to the development of fruit fly treatments to control pest species within the* B. dorsalis *complex and determine an acceptable common approach.*
* *identify phytosanitary treatments for pest species within the* B. dorsalis *complex used nationally or regionally*
* *provide a forum for phytosanitary treatment experts to understand the constraints with developing fruit fly treatments and identify common methods to address these constraints*

***Expected outputs of the meeting:***

* *a list of approved (by NPPO or RPPO)* phytosanitary *treatments used to control pest species within the* Bactrocera dorsalis *complex*
* *agreement on a common approach to the development of fruit fly phytosanitary treatments, including methodologies, statistical analyses, carrying out confirmatory trials, evaluating and submitting*
* *a plan for future collaboration among all involved in the consultation*
* *a joint peer reviewed paper on the development of phytosanitary treatments for fruit flies*

***Resources are available for a limited number of experts in accordance with IPPC criteria of prioritization to receive travel assistance****.*

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| ***Steering committee:***  *Ms Ana Lilia MONTEALEGRE (Mexico), TPFF Steward*  *Mr Jan Bart ROSSEL ( Australia), TPPT Steward*  *Mr Manabu SUZUKI (Japan) Organizer*  *Mr Tim GROUT (South Africa) Expert*  *Mr Feng Chunguang (China) Expert* | ***Facilitators:***  *Mr Guy HALLMAN (USA) TPPT Member*  *Mr Andrew JESSUP (Australia) TPPT Member* | ***IPPC Secretariat:***  *Ms Adriana Moreira*  *Mr Rui CARDOSO PEREIRA (Joint FAO/IAEA Division)* |

**References used to develop concept note:**

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|  | Drew, R. A. I., Tsuruta, K. and White, I. M. (2005) A new species of pest fruit fly (Diptera: Tephritidae: Dacinae) from Sri Lanka and Africa. African Entomology 13, 149-154. |
|  | Grout, T. G., Daneel, J. H., Mohamed S. A., Ekesi, S., Nderitu, P. W., Stephen P. R., and Hattingh, V. (2011) Cold susceptibility and disinfestation of *Bactrocera invadens* (Diptera: Tephritidae) in Oranges J. Econ. Entomol. 104(4): 1180-1188 |
|  | Lux, S. A., Copeland, R. S., White, I. M., Marakhan, A., and Billah, M. K. (2003) A new invasive fruit fly species from the *Bactrocera dorsalis* (Hendel) group detected in east Africa: Insect Sci Application 23:355-361 |
|  | San Jose, M., Leblanc, L., Geib, S. M., and Rubinoff, D. (2013) An evaluation of the species status of *Bactrocera invadens* and the systematics of the *Bactrocera dorsalis* (Diptera: Tephritidae) complex. Ann. Entomol. Soc. America, 106(6): 684-694. |
|  | Schutze M.K., Krosch M.N., Armstrong K.F., Chapman T.A., Englezou A., Chomič A., Cameron S. L., Hailstones D., and Clarke A.R. (2012) Population structure of *Bactrocera dorsalis s.s*., *B. papayae* and *B. philippinensis* (Diptera: Tephritidae) in southeast Asia: evidence for a single species hypothesis using mitochondrial DNA and wing-shape data. BMC Evolutionary Biology 12: 130. |

***Annex 1: Proposed items to be discussed during the Expert Consultation on phytosanitary treatments for Bactrocera dorsalis complex***

***1. General***

* *Overview of the development of fruit fly phytosanitary treatments under the IPPC framework*
* *Challenges with the data review and evaluation process*
* *History of treatments developed to control the B. dorsalis complex including status of species within the complex relating to treatment efficacy and development generic treatments.*
* *Current RPPO or NPPO approved programmes, to control the B. dorsalis complex*

***2. Development of phytosanitary treatments for the B. dorsalis complex (Experimental design and other factors)***

* *Key issues identified by the expert consultation on cold treatments relating to development of cold treatments for fruit flies*
* *Most tolerant life stage and differences among populations and life stages*
* *Identification of the B. dorsalis complex*
* *Tolerance among species and subspecies*
* *Tolerance in colony and wild populations*
* *Differences in susceptibility between larvae reared on diet and fruits*
* *Colony quality effect on treatment efficacy*
* *Host conditions and effects on pest tolerance to the phytosanitary treatment (e.g. species, cultivar)*
* *Acclimation ability*
* *Measuring survival/mortality*
* *Inoculation rate and methods*
* *Advantages and disadvantages of extrapolating from low test subject numbers*
* *Confidence limits and sample size in quarantine research*
* *Efficacy level calculation required for treatments*
* *Experimental conditions and their variations*

***3. Operational conditions and commercial practicability***

* *Key issues identified by the expert consultation on cold treatments relating to development of cold treatments for fruit flies*
* *The most suitable implementation technology approved by contracting parties (i.e. procedure for pre-treatment, treatment, post-treatment)*
* *Possibility of generic treatments*
* *Differences between treatments approved within bilateral agreements*
* *Practical extension of treatment schedules from large scale trials into commercial application*
* *Confirmatory tests*
* *Treatment starting point and “±” issue*
* *Possibility of establishing a temperature threshold*

***4. Overview and conclusions***

* *General and specific conclusions*
* *Draft outline of peer reviewed paper*
* *How to use the outcome of the Expert consultation on phytosanitary treatments for the B. dorsalis complex*
* *Possible Terms of references and rules of procedures for the Expert consultation on phytosanitary treatments for the B. dorsalis complex (if the consultation will be continued).*