SCIENTIFIC OPINION

Statement on the comments by Hattingh et al. (2014) on the EFSA PLH Panel (2014) Scientific Opinion on Citrus Black Spot[1]

EFSA Panel on Plant Health (PLH)[2]

European Food Safety Authority (EFSA), Parma, Italy

ABSTRACT

Following a request from the European Commission, the EFSA Panel on Plant Health (EFSA PLH Panel) was asked to react to a document entitled "Comments on the European Union Food Safety Authority's Pest Risk Assessment for *Phyllosticta citricarpa*", authored by Hattingh et al., which was posted online in August 2014 on the website of Citrus Research International (Pty) Ltd, South Africa. Citrus black spot (CBS), caused by the fungus *Phyllosticta citricarpa* (McAlpine) Van der Aa, is a fruit-blemishing and leaf-spotting disease affecting citrus. *P. citricarpa* is not known to occur in the EU territory and is regulated as a quarantine organism in citrus (Council Directive 2000/29/EC). The Panel assessed the comments by Hattingh et al. in the light of the content of the EFSA PLH Panel Scientific Opinion on CBS and the EFSA report detailing responses to comments received during the public consultation on the draft opinion. The Panel stands by the EFSA PLH Panel Scientific Opinion on CBS and considers that the comments by Hattingh et al. have been thoroughly addressed in the EFSA report on the public consultation on the EFSA PLH Panel Scientific Opinion on CBS. A detailed point by point reply to the comments by Hattingh et al. is provided in an Appendix of this Panel statement. Since September 2014, EFSA has written to the lead author of the comments trying to engage in a scientific dialogue concerning the sources of uncertainty related to the risks posed by *P. citricarpa* to plant health in the EU, so as to identify ways to reduce such uncertainties (e.g. with further research and/or data exchange). The EFSA PLH Panel also remains open to such constructive dialogue in the future.

KEY WORDS

Citrus black spot, exotic fungi, *Guignardia citricarpa*, invasion biology, *Phyllosticta citricarpa*, plant trade, uncertainty

[1] On request from the European Commission, Question No EFSA-Q-2014-00606, adopted on 30 Dec 2014.

[2] Panel members: Richard Baker, Claude Bragard, David Caffier, Thierry Candresse, Gianni Gilioli, Jean-Claude Grégoire, Imre Holb, Michael John Jeger, Olia Evtimova Karadjova, Christer Magnusson, David Makowski, Charles Manceau, Maria Navajas, Trond Rafoss, Vittorio Rossi, Jan Schans, Gritta Schrader, Gregor Urek, Irene Vloutoglou, Stephan Winter and Wopke van der Werf. Correspondence: alpha@efsa.europa.eu

Suggested citation: EFSA PLH Panel (EFSA Panel on Plant Health), 2015. Statement on the comments by Hattingh et al. (2014) on the EFSA PLH Panel (2014) Scientific Opinion on Citrus Black Spot. EFSA Journal 2015;13(1):3990, 26 pp., doi:10.2903/j.efsa.2015.3990

Available online: www.efsa.europa.eu/efsajournal

TABLE OF CONTENTS

Abstract 1
Background as provided by the European Commission 3
Terms of reference as provided by the European Commission 3
Statement 4
1. Introduction 4
1.1. Purpose 4
1.2. Scope 4
2. Methodology 4
3. Actions taken 4
Conclusions 6
References 7
Abbreviations 7
Appendix A. 8
Point by point reply to the comments of Hattingh et al. (2014) 8
Summary of the EFSA (2014) public consultation comments highlighted by Hattingh et al. (2014), with an assessment of whether the comments were properly addressed by the EFSA PLH Panel in the report on the CBS public consultation (EFSA, 2014) 14
References cited in Appendix A 25

BACKGROUND AS PROVIDED BY THE EUROPEAN COMMISSION

The European Commission became aware in September 2014 of the publication on the website of the South African organisation Citrus Research International (Pty) Ltd (http://www.citrusres.com) of a document entitled "Comments on the European Union Food Safety Authority's Pest Risk Assessment for *Phyllosticta citricarpa*". This document, which is dated August 2014, provides comments on the recent EFSA's Scientific Opinion on the risk of *Phyllosticta citricarpa* (McAlpine) Van der Aa (syn. *Guignardia citricarpa* Kiely) for the EU territory with identification and evaluation of risk reduction options (EFSA Journal 2014;12(2);3557; http://www.efsa.europa.eu/en/efsajournal/doc/3557.pdf). The document in question was prepared by a similar international panel of scientists which provided comments to EFSA during the public consultation on the pest risk assessment for *Phyllosticta citricarpa*. Therefore, this document also includes comments on EFSA's reply to the submission made by that panel of scientists.

TERMS OF REFERENCE AS PROVIDED BY THE EUROPEAN COMMISSION

The European Commission requested EFSA to provide an urgent reaction (initially before the end of September 2014) to a publication on the web of the South African organisation Citrus Research International, entitled "Comments on the EFSA's Pest risk assessment for *Phyllosticta citricarpa*". This document dated of August 2014 provides comments from an international panel of scientists on EFSA's recent pest risk assessment for *Phyllosticta citricarpa* (EFSA PLH 2014). Taking into account that South African phytosanitary authorities have recently decided to unilaterally restrict the export of citrus fruits to the EU in order to give EFSA sufficient time to engage with the authors of (Hattingh et al. 2014) in a scientific dialogue, the European Commission extended the deadline for delivering a reaction by EFSA to the end of December 2014, thereby encouraging EFSA to continue to attempt to engage with the authors of (Hattingh et al. 2014) in a scientific dialogue to reduce data gaps and related key uncertainties for the assessment and management of the risk posed by *P. citricarpa* to plant health in the EU.

STATEMENT

1. Introduction

1.1. Purpose

This document is a statement of the EFSA Scientific Panel on Plant Health (PLH Panel) on the comments on the published EFSA PLH Panel Scientific Opinion on the citrus black spot (CBS) pathogen (EFSA PLH Panel, 2014) which were provided by an international panel of scientists (Hattingh et al., 2014) and published online in August 2014 by Citrus Research International (Pty) Ltd, a South African research organization.

1.2. Scope

This statement addresses the comments by Hattingh et al. (2014) on the published EFSA PLH Panel Scientific Opinion on CBS (EFSA PLH Panel, 2014) and on the related report on the public consultation (EFSA, 2014).

CBS is a disease of citrus caused by the fungal pathogen *Phyllosticta citricarpa* (EFSA PLH Panel, 2008, 2014). CBS is not known to occur in the EU but is present in various tropical and sub-tropical citrus-growing regions (e.g. Australia, Argentina, Brazil, China, and South Africa) (EFSA PLH Panel, 2014). CBS has recently established and is spreading in Florida (El-Lissy 2014).

2. Methodology

The PLH Panel reviewed the comments by Hattingh et al. (2014) and assessed each of them in conjunction with the PLH Panel's response (EFSA, 2014) to the public consultation comments associated with the EFSA PLH Panel Scientific Opinion on CBS (EFSA PLH Panel, 2014).

In addition, the lead author of Hattingh et al. (2014) was formally contacted by EFSA in an attempt to engage in a constructive scientific dialogue (please see section 3 of this statement), so as to identify key areas of uncertainty, which could be reduced by further research and data collection / exchange.

3. Actions taken

A summary of the actions taken in response to the comments by Hattingh et al. (2014) is provided in Table 1.

Table 1: Summary of the actions taken by EFSA and replies from the lead author of Hattingh et al. (2014)

Date	Action taken by EFSA	Reply from V. Hattingh
3 Sep 2014	The comments by Hattingh et al. (2014) were reviewed and assessed in the light of the EFSA PLH reply to the comments already received during the public consultation associated with the EFSA PLH (2014) on CBS (please see Appendix A)	-
18 Sep 2014	A letter was sent to V. Hattingh, Chief Executive Officer of Citrus Research International (Pty) Ltd, South Africa • explaining the request from the European Commission to react to the online statement by Hattingh et al. (2014), • describing the action taken by	V. Hattingh replied on 24 Sep 2014 that "a constructive way forward may be if EFSA were prepared to revise its risk assessment on the basis of the inputs provided by the Expert Panel in 2013 [Hattingh et al., 2013] and provide an opportunity

Date	Action taken by EFSA	Reply from V. Hattingh
	EFSA on 3 Sep 2014, • stating that the EFSA PLH Panel stood by the EFSA PLH Scientific Opinion (2014), • and proposing a meeting with the authors of Hattingh et al. (2014) to discuss key uncertainties and data needs	for the CBS Expert Panel to comment on (not excluding the possibility of a meeting if feasible from a timing and logistics perspective) the draft of such an amended assessment."
16 Oct 2014	A letter was sent to V. Hattingh, • explaining that the European Commission had postponed the deadline for a reaction by EFSA to the comments by Hattingh et al. (2014) to the end of December 2014, • reiterating that a revision of the EFSA PLH Panel Scientific Opinion cannot be a prerequisite to a dialogue (2014), • and again proposing a meeting with the authors of Hattingh et al. (2014) to analyze the nature and sources of diverging scientific opinions between the authors of Hattingh et al. (2014) and the EFSA PLH Panel	V. Hattingh replied on 22 Oct 2014 that "as a first next step, EFSA should respond comprehensively to the CBS Expert Panel's 2013 inputs [Hattingh et al., 2013]. A detailed written response on the Panel's 2013 inputs would provide a useful platform for further engagement of substance."
7 Nov 2014	A letter was sent to V. Hattingh, • explaining that the comments by Hattingh et al. (2013) had already been addressed in the EFSA (2014) report on the public consultation on the EFSA PLH Panel (2014) Scientific Opinion on CBS and that appropriate explanations were provided in that report, • reiterating the offer to start a scientific dialogue on the main uncertainties and data needs, • and providing a list of the key uncertainties extracted from the EFSA PLH Panel (2014) Scientific Opinion on CBS (see sections 3.2.12, 3.3.6., 3.4.6., and 3.6.6 of the EFSA PLH Panel (2014) Scientific Opinion on CBS).	No formal reply from V. Hattingh as of 30 Dec 2014

CONCLUSIONS

1. The Panel stands by the EFSA PLH Panel (2014) Scientific Opinion on CBS;

2. A point by point reply to the comments by Hattingh et al. (2014) is provided in Appendix A. However, the comments provided by Hattingh et al. (2014) on the EFSA PLH Panel (2014) Scientific Opinion on CBS have already been thoroughly addressed by the EFSA (2014) report to the public consultation on the EFSA PLH Panel (2014) Scientific Opinion on CBS;

3. The recent publication by Perryman et al. (2014) is an example of how scientific research can help reduce uncertainties in the risk assessment related to CBS. Perryman et al. (2014) investigated the mechanism and extent of splash dispersal of *P. citricarpa* pycnidiospores from infected symptomatic citrus fruit for the first time. The meta-analysis by Makowski et al. (2014) on the effectiveness of fungicide treatments for the control of CBS is another example that underlies the importance of sharing data and analyzing the available evidence comprehensively;

4. Despite these recent studies, there are still various sources of uncertainty related to the citrus fruit pathway and the probability of *P. citricarpa* establishing and causing impacts in the EU (see sections 3.2.12, 3.3.6., 3.4.6., and 3.6.6 of the EFSA PLH Panel (2014) Scientific Opinion on CBS). These areas of uncertainty should be considered together with the reasoning and explanations provided in EFSA PLH Panel (2014). It should also be noted that reducing the uncertainty associated with the risk ratings provided in EFSA PLH Panel (2014) will not necessarily result in a reduction of the level of estimated risk. Reducing uncertainty might also result in increased revised risk ratings;

5. The Panel remains open for scientific dialogue, identification of areas for further research and exchange of information with the authors of Hattingh et al. (2014) and other researchers in order to reduce the level of uncertainty in the assessment of the risk posed by *P. citricarpa* to plant health in the EU.

REFERENCES

EFSA PLH Panel (EFSA Panel on Plant Health), 2008. Scientific Opinion of the Panel on Plant Heath on a request from the European Commission on *Guignardia citricarpa* Kiely. EFSA Journal 925, 1-108.

EFSA PLH Panel (EFSA Panel on Plant Health), 2014. Scientific Opinion on the risk of *Phyllosticta citricarpa* (*Guignardia citricarpa*) for the EU territory with identification and evaluation of risk reduction options. EFSA Journal 2014;12(2):3557, 243 pp. doi:10.2903/j.efsa.2014.3557.

EFSA, 2014. Outcome of the public consultation on the draft Scientific Opinion on the risk of *Phyllosticta citricarpa* (*Guignardia citricarpa*) for the EU territory with identification and evaluation of risk reduction options. EFSA supporting publication 2014: EN-555. 195 pp. Available online: www.efsa.europa.eu/publications.

El-Lissy O, 2014. APHIS Expands Citrus Black Spot (*Guignardia citricarpa*) Regulated Area in Florida. APHIS, USDA, accessed online September 2014 at http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus/downloads/black_spot/DA-2014-29.pdf.

Hattingh V et al., 2013. Comments on the European Union Food Safety Authority's draft Pest Risk Assessment for *Phyllosticta citricarpa* during the public consultation. Available in: EFSA, 2014. Outcome of the public consultation on the draft Scientific Opinion on the risk of *Phyllosticta citricarpa* (*Guignardia citricarpa*) for the EU territory with identification and evaluation of risk reduction options. EFSA supporting publication 2014: EN-555. 195 pp. Available online: www.efsa.europa.eu/publications.

Hattingh V et al., 2014. Comments on the European Union Food Safety Authority's Pest Risk Assessment for *Phyllosticta citricarpa*. Available online on the website of Citrus Research International at: http://www.citrusres.com/sites/default/files/documents/Comment%20on%20the%202014%20EFSA%20PRA%20final.pdf (last accessed online 25 November 2014).

Makowski D, Vicent A, Pautasso M, Stancanelli G, Rafoss T, 2014. Comparison of statistical models in a meta-analysis of fungicide treatments for the control of citrus black spot caused by *Phyllosticta citricarpa*. European Journal of Plant Pathology 139, 1, 79-94.

Perryman SAM, Clark SJ, West JS, 2014. Splash dispersal of *Phyllosticta citricarpa* conidia from infected citrus fruit. Scientific Reports 4, 6568. doi:10.1038/srep06568.

ABBREVIATIONS

CBS	Citrus Black Spot
EFSA	European Food Safety Authority
EU	European Union
PLH Panel	Plant Health Panel
PRA	Pest Risk Analysis

Appendix A.

Point by point reply to the comments of Hattingh et al. (2014)

A point by point reply to the comments by Hattingh et al. (2014) is provided in Tables 2 and 3.

Table 2: Point by point reply to the comments by Hattingh et al. (2014) on the EFSA's responses to comments provided during the public consultation (EFSA, 2014)

No.	Comment by Hattingh et al. (2014)	Reply
1a	"Many of EFSA's responses to the comments received do not address the technical and scientific essence of the inputs provided"	EFSA replied to the comments received during the public consultation as thoroughly as feasible, also given the large number of the comments received, and the repetitive nature of many comments. The technical and scientific essence of the inputs provided was properly addressed, considering also the additional inputs which have included in the revised version of the EFSA PLH Panel (2004) Scientific Opinion on CBS
1b	"In some cases, EFSA states that it has considered the comments, but there is no indication that it has indeed done so, or has changed the EFSA position based on the input"	The Scientific Opinion was updated based on the comments received, if the comments provided evidence or new data to support their claim
1c	"In some cases EFSA's responses simply do not relate directly to the comment provided"	When the comments received were a repetition of previous comments, the EFSA PLH Panel replied indirectly by referring to a previous direct reply
2a	"In some cases EFSA's responses to the comments provided suggest that EFSA purports to have a better understanding of the research results than the researchers who themselves conducted the research"	The EFSA PLH Panel has extensive experience in assessing research results and scientific publications and their implications for the risk posed to plant health in the EU
2b	"EFSA seems to have overlooked the fact that, in many cases, the authors of the scientific papers were members of the Expert Panel"	The EFSA PLH Panel did not overlook this coincidence and took extra care to assess the research results obtained by the authors of Hattingh et al. (2014)
2d	"In other words, EFSA has attached more scientific value to its own interpretation of the published results that the interpretation of the authors themselves"	The EFSA PLH Panel attaches high value to scientific results and the interpretations made by the authors in their own publications and strives to avoid bias and conflicts of interest in its impartial assessment of the available evidence
3a	"Some of the EFSA responses seem to be based on the premise that EFSA has a better understanding of CBS than the Expert Panel members"	This is not substantiated. The EFSA PLH Panel evaluated the available evidence objectively and on the basis of an extensive review of the scientific literature
3b	"This is particularly problematic when it relates to local conditions where CBS occurs, or to familiarity with CBS under relevant field conditions"	Local conditions relevant for CBS development which were supported by published scientific evidence were considered in the EFSA PLH Panel (2014) Scientific Opinion on CBS
3c	"Of particular concern is EFSA's disregard of scientific evidence (and Expert Panel's comments) indicating the known duration of fruit susceptibility and the relatively high lower-temperature threshold for *P. citricarpa* spore release and infection, as well as EFSA's interpretation of the probability of transfer, infection and establishment"	This is not substantiated. These aspects have been addressed in EFSA PLH Panel (2014) by an extensive review of the available scientific evidence. The EFSA PLH Panel regrets that a request sent to South African authorities for data with which to reduce uncertainties about some of these issues has not yet been answered

No.	Comment by Hattingh et al. (2014)	Reply
3d	"In response to their relative CBS inexperience, EFSA responded that it has benefited from the technical input from the Expert Panel, but then illogically disregarded most of the Expert Panel's inputs and came to conclusions that are opposite of the Expert Panel's"	The EFSA PLH Panel benefitted from input within the public consultation on the EFSA PLH Panel (2014) CBS Opinion, whenever the comments received provided supporting scientific evidence or new information. Given the key uncertainties remaining on the risk posed to plant health in the EU by *P. citricarpa*, the EFSA PLH Panel cannot agree with Hattingh et al. (2014) that there is no risk through the citrus fruit (without leaves) pathway with no uncertainty, for the reasons explained in the EFSA PLH (2014) Scientific Opinion on CBS
4a	"In some cases, EFSA's responses provide a scientifically weak argument (that is without appropriate evidence, unpublished work, untested assumptions, inappropriate test conditions, untested hypothetical reasoning or based on erroneous information) as justification for disregarding comments that have strong scientific or evidential support	This is not substantiated. The EFSA PLH Panel based its conclusions on an extensive review of the available evidence. The recent publication by Perryman et al. (2014) is an example of how scientific research can help reduce uncertainties in the risk assessment related to CBS. Perryman et al. (2014) investigated the mechanism and extent of splash dispersal of *P. citricarpa* pycnidiospores from infected citrus fruit for the first time. The meta-analysis by Makowski et al. (2014) on the effectiveness of fungicide treatments for the control of CBS is another example that underlies the importance of sharing data and analyzing the available evidence comprehensively
4b	"Of particular concern, is EFSA's assessment of climate suitability for *P. citricarpa* establishment and the pest categorization of *P. citricarpa* in the EU, the probability of transfer, splash dispersal and probability of entry."	The comments on all these issues were addressed in the report on the public consultation (EFSA, 2014) on the EFSA PLH Panel (2014) Scientific Opinion on CBS
5	"In contrast with point 4 above, EFSA in some cases enthusiastically supports comments that were without substantiation, supportive evidence or relevance, but were apparently in agreement with a position taken by EFSA"	The EFSA PLH Panel merely thanked those who provided the comments for their input. It is noteworthy that not all the comments received during the public consultation were in agreement with the position taken by the authors of Hattingh et al. (2014)
6a	"Some of EFSA's responses reflect a lack of impartial objectivity. This is reflected by a qualitative and simplistic categorization of the relationship between comments provided and EFSA's response"	The EFSA Plant Health Panel takes the utmost care to remain impartial and objective in all of its mandates
6b	"Comments supportive of a position in the draft EFSA *P. citricarpa* PRA were either accepted on face value or were given serious consideration. Other comments (including those of the Expert Panel) that did not support EFSA's position were either ignored or were given cursory consideration without affecting any amendment to the final EFSA assessment"	Serious consideration was given to all comments received. The draft opinion was updated whenever the comments received provided additional information or were supported by scientific evidence. Given the repetitive nature of some of the comments received, the responses provided had to be in some cases short (e.g. when redirecting the reader to more detailed replies to previous comments)
6c	"This suggests a systemic failure of EFSA PRA process in that EFSA seems to have been biased towards defending an existing position rather than	As in all EFSA activities, members of the EFSA PLH Panel have to provide a declaration of interests (DoI) to avoid potential conflicts of interests and guarantee objectivity in their assessments. Panel selection

No.	Comment by Hattingh et al. (2014)	Reply
	conducting an unbiased, objective assessment of the available peer reviewed scientific evidence pertaining to the risk potential"	procedures and DoIs are of public domain to assure transparency
7	"The suggestion that EFSA's assessment was biased toward defending an existing position, is also supported by the observation that EFSA has generally over-stated various risk ratings, which, in spite of scientific literature to the contrary, EFSA attempted to justify by the adoption of highly subjective uncertainty levels"	The risk ratings in the EFSA PLH Panel (2014) Scientific Opinion on CBS are supported by harmonized PRA procedures, in line with IPPC and EPPO standards, including thorough assessment of the evidence and a realistic evaluation of the related uncertainties

Table 3: Point by point reply to the comments by Hattingh et al. (2014) on the conclusions of the EFSA PLH Panel (2014) Scientific Opinion on CBS

No.	Comment by Hattingh et al. (2014)	Reply
1	"The Expert Panel provided detailed information indicating the erroneous nature of specific and overall conclusions contained in the draft EFSA *P. citricarpa* PRA. The risk ratings and conclusions in the final EFSA PRA were not amended in response to those comments and EFSA did not provide scientifically sound justification for not appropriately adjusting the key conclusions in the final EFSA PRA"	The EFSA PLH Panel considered all received comments with care and, when new scientific evidence or additional data were provided, used these comments to improve the Opinion
2a	"EFSA has used weak evidence, such as unpublished, non-peer reviewed findings from experiments conducted under artificial conditions, lacking in appropriate scientific procedure, replication and controls, to support key positions that are in conflict with scientifically sound published evidence and the Expert panel's comments"	This claim is not supported by scientific evidence. The EFSA PLH Panel (2014) Scientific Opinion on CBS is supported by the best available, peer-reviewed evidence, as can be evinced from the comprehensive literature list provided at the end of the Opinion
2b	"An example is EFSA's use of the Perryman and West (2014) report, which used contrived laboratory conditions with peculiar, large, artificial lesions, to support its peculiar views on splash dispersal. These views are in conflict with the Expert Panel's experience and other available scientific information"	The groundbreaking study on splash dispersal by Perryman and collaborators, which was performed at the Rothamsted Research institute, a center of excellence for research on splash dispersal of plant pathogens, has now been published in a highly-reputable and peer-reviewed journal (please see Perryman et al. 2014)
2c	"Another example is EFSA's refusal to include positive and negative controls in their climate modelling. The inclusion of such controls is a standard scientific principle and the Expert Panel regrets EFSA's refusal to include these controls as it would have placed their findings in context and alignment with reality. In fact, evidence of significant differences in model predictions for EU localities and positive and negative control	For the Fourie et al. (2013) model for *Phyllosticta* spp. ascospores, it is difficult to include controls because it is an empirical model developed and evaluated in a specific location in South Africa. Even in the original publication by Fourie et al. (2013), proper evaluation (validation) outside the native range of the model was lacking, as pointed out in the EFSA PLH Panel (2014) Scientific Opinion on CBS: 3.3.2.4- "Model 1 was run by Fourie et al. (2013) using average monthly climatic data for CBS-free

No.	Comment by Hattingh et al. (2014)	Reply
	localities was presented to EFSA, and also published by EFSA (2008), but this was not regarded by EFSA (2014)"	locations, including Valencia (Spain), Messina (Italy) and Pontecagnano (Italy) in Europe in addition to CBS-affected sites in Brazil, South Africa and the USA. However, model outputs were not compared (evaluated/validated) with ascospore trapping data at any of these CBS-affected locations" Hourly data are needed to run the model by Magarey et al. (2005). Data of this high temporal resolution were not available from CBS-affected areas. Positive and negative controls were included in the EFSA PLH Panel (2008) Scientific Opinion (Figs. 21 to 26) and, as can be seen in the text below, in the EFSA PLH Panel (2014) Scientific Opinion on CBS, the simulations were updated using the same parameter values but at higher spatial resolution. Thus, positive and negative controls were implicitly considered: 3.3.2.4-"The model was also applied by EFSA (2008) to climatic datasets from locations where CBS is present as well as extra-EU locations where it is not known to occur. In this scientific opinion, the model simulation results for climatic suitability for *P. citricarpa* infection in EU citrus-growing areas were updated using a four times higher spatial resolution (25 km)"
2d	"A further example is that EFSA generated highly uncertain leaf wetness simulation data (as acknowledged by EFSA in 2008) that have not been subjected to peer review through publication, and used these data as an important component of the climate modelling work conducted by EFSA in the final PRA"	With regard to simulated leaf wetness, as can be evinced from the text below from the EFSA PLH (2014) Scientific Opinion on CBS, this research was published in highly reputable journals: 'Theoretical and Applied Climatology' and 'Agricultural and Forest Meteorology' 3.3.2.5-"This model was first run for *P. citricarpa* for EU citrus-growing areas by EFSA (2008) with meteorological data from the MARS Crop Yield Forecasting System (MCYFS; JRC Monitoring Agricultural Resources Unit) interpolated to a 50-km grid for the EU citrus-growing areas with simulated wetness data (Bregaglio et al., 2010, 2011)"
3a	"EFSA continued to exaggerate the risk ratings by reflecting what they considered to be possible scenarios as having a "likely" risk rating"	The risk ratings in the EFSA PLH Panel (2014) Scientific Opinion on CBS have been duly justified in the text of the Opinion
3b	"Moreover, EFSA continued failing to appropriately consider the cumulative reduction in probability arising from the combination of unlikely sequential events that all have to occur to produce an outcome of epidemiological significance"	EFSA did consider appropriately in the simplified pathway model the cumulative reduction in probability arising from the combination of sequential events that all have to occur to produce an outcome of epidemiological significance and concluded that the probability of this outcome to occur was not at all negligible, particularly in the absence of control measures
3c	"For example, EFSA considered some aspects of the latter in its simplified pathway model, which indicated that if fresh fruit were to imported under no regulation from medium to high CBS origins, some contaminated fruit or fruit	The EFSA PLH Panel stands by the risk rating provided in the EFSA PLH Panel (2014) Scientific Opinion on CBS for the reasons explained there. Concerns of the EFSA PLH Panel regarding the risk posed to plant health in the EU territory by the citrus fruit pathway from CBS infested regions are

No.	Comment by Hattingh et al. (2014)	Reply
	waste might end up in was piles in "close" proximity to citrus orchards. EFSA acknowledge that "the pest still has some limitations for transfer to a suitable host in the risk assessment area", but still concluded that "the pathway should be assessed as moderately likely". This assessment of the risk ignores the scientific evidence and comments provided by the Expert Panel, which indicated the debilitating nature of the so-called limitations in terms of CBS epidemiology"	supported by the available scientific evidence
4	"EFSA cannot claim that its final *P. citricarpa* PRA has been subjected to thorough and rigorous public comment. Key components rely heavily on unpublished, non-peer reviewed, EFSA-commissioned evidence, that was not made available at the time that the draft report was released for comment"	The public consultation on the draft of the EFSA PLH Panel (2014) Scientific Opinion on CBS was indeed thorough and rigorous. The few studies that were still under peer review at the time of the public consultation on the EFSA PLH Panel (2014) Scientific Opinion on CBS have now appeared in peer-reviewed journals (e.g., Makowski et al. 2014; Perryman et al. 2014). Moreover, as stated in the report on the public consultation on the EFSA PLH Panel (2014) Scientific Opinion on CBS, "EFSA opinions do go through a peer review process before publication because only a small working group composed of the EFSA PLH Panel and topic experts initially formulate the draft Scientific Opinion, which is then scrutinised by the whole Panel before publication in the EFSA Journal" (EFSA, 2014)
5	"The Expert Panel considers EFSA's responses to many comments that the Expert Panel provided and that pertain to key components of the final EFSA *P. citricarpa* PRA to be deficient"	The EFSA PLH Panel has reassessed its responses to the comments received during the public consultation and stands by those replies. The comments have been addressed in a satisfactory way (please see below for details)
6	"The Expert Panel considers aspects of the unpublished data provided by EFSA in support of key components of EFSA's assessment to be unreliable, erroneous and in conflict with strong scientific evidence"	The EFSA PLH Panel disagrees with this view. The data on which the EFSA PLH Panel (2014) Scientific Opinion on CBS relies are of good quality. The EFSA PLH Panel regrets that in some cases it was not possible to use data of even better quality because a request sent to South African authorities for data has not yet been answered
6b	"An example is the EFSA approach to climate modelling and its disregard of the comments provided by the Expert Panel, some of its members whom EFSA quotes in support of their own contested approach"	The climate modelling approaches adopted within the EFSA PLH Panel (2014) Scientific Opinion on CBS have been instrumental in showing that the climate modelling approach adopted by some of the members of the Hattingh et al. (2014) group of authors is not providing reliable conclusions
7	"EFSA maintains conclusions in its final PRA that are in conflict with the body of available scientific evidence and expert opinion, without having provided reliable evidence to support such alternative views"	The EFSA PLH Panel does not concur with this statement. The EFSA PLH Panel (2014) Scientific Opinion on CBS has been based on a thorough review of the available literature and scientific evidence
8	"In the absence of reliable evidence to the contrary, the Expert Panel upholds the assessment it communicated to EFSA in 2013, namely "we do not agree with the EFSA (2013)'s assessment of risk	The EFSA PLH Panel does not concur with this statement. The conclusion of Hattingh et al. (2014) that there is no risk (with no uncertainty) is not supported by the available scientific evidence, for the reasons explained in the EFSA PLH Panel (2014)

No.	Comment by Hattingh et al. (2014)	Reply
	and we consider suitable expert opinion and scientific information to weigh strongly in favour of the no-risk assessment"	Scientific Opinion on CBS
9	"In relation to the final EFSA *P. citricarpa* PRA, the Expert Panel accordingly upholds the following conclusion, which it reached when considering the draft EFSA *P. citricarpa* PRA; "In conclusion, we are in agreement with earlier PRAs, conducted by South Africa and USA, in which it was concluded that citrus fruit is not an epidemiologically significant pathway for *P. citricarpa* to enter, establish, spread and have significant economic impact within the PRA area (EU)"	The EFSA PLH Panel works with the following five categories of risk: very low, low, medium, high, very high. The EFSA PLH Panel finds it rather peculiar that Hattingh et al. (2014) persist in concluding that there is no risk at all, when the category of "no risk" is not an internationally recognized category by risk assessors

Summary of the EFSA (2014) public consultation comments highlighted by Hattingh et al. (2014), with an assessment of whether the comments were properly addressed by the EFSA PLH Panel in the report on the CBS public consultation (EFSA, 2014)

Hattingh et al. (2014) listed a series of public consultation comments which they considered as not properly addressed in EFSA (2014). A summary of these comments highlighted by Hattingh et al. (2014) is shown in Table 4, together with an assessment of whether the comments were addressed by the EFSA PLH Panel.

Table 4: Summary of the EFSA (2014) public consultation comments highlighted by Hattingh et al. (2014), with an assessment of whether the comments were properly addressed by the EFSA PLH Panel in the report on the CBS public consultation.

Note: type of criticism by Hattingh et al. (2014):

A) According to Hattingh et al. (2014), the technical and scientific nature of comments were not addressed by EFSA

B) According to Hattingh et al. (2014), EFSA has a better understanding of the research results than researchers who conducted the research

C) According to Hattingh et al. (2014), EFSA has a better understanding of CBS than the CBS expert panel members

D) According to Hattingh et al. (2014), EFSA responses provided a scientifically weak argument

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
3	A, C	Trade in citrus fruit and the role of pycnidiospores for the introduction of the pathogen	Comment was addressed by EFSA PLH Panel, by referring to the Perryman & West (2014) study
4	A	Same as 3	Refers to reply to comment 3
5	A	Same as 3	Refers to reply to comment 3
7	A	Same as 3	Refers to reply to comment 3
19	D	CBS spread to new areas with fruit (without leaves) as pathway	Comment was addressed by EFSA PLH Panel, by pointing out that there are no precedents for the import of such large amounts of citrus fruit from CBS-affected areas into CBS-free areas in the scenario of absence of phytosanitary regulations
20	D	CBS spread to new areas through the movement of infected propagating plant material	Comment was addressed by EFSA PLH Panel, by referring to the answer to comment 19
21	A, D	Opportunities for introduction in the past and current lack of risk	Comment was addressed by EFSA PLH Panel, by pointing out that citrus fruit has been imported into citrus-growing countries of the EU only when fulfilling current phytosanitary measures for *P. citricarpa*. Moreover, the import of citrus fruit from CBS-affected areas into the main citrus producing countries of the EU (e.g. Spain), before

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
			they joined the EU, was banned by national regulations (see section 3.1.3.2 in the EFSA PLH Panel (2014) Scientific Opinion on CBS)
23	A, C	CBS is primarily a cosmetic disease, causing fruit rind blemish	Comment was addressed by EFSA PLH Panel, by pointing out that rind blemishes make the fruit unsuitable for the fresh market and that the EU citrus production is mostly targeted to the fresh market
24	B, C, D	Fungicide spray programmes, if well managed, are very effective in controlling CBS	Comment was addressed by EFSA PLH Panel, by referring to the meta-analysis in section 3.6.1 of the EFSA PLH Panel (2014) Scientific Opinion on CBS (which was later published by Makowski et al. 2014)
25	A	"CBS is only a serious disease under highly suitable climatic conditions in combination with the absence of general Good Agricultural Practices of commercial citrus production".	Comment was addressed by EFSA PLH Panel, by stating that the meta-analysis on fungicide efficiency undertaken by the Panel identified a substantial variability in the reduction of CBS disease levels
29	A	All of the entry and establishment components need to be considered sequentially.	Comment was addressed by EFSA PLH Panel, answering that this issue has been taken on board in the revised scientific opinion including a quantitative pathway analysis model
31	C	"If CBS was to establish anywhere in the EU, this would be in small fragmented parts of the EU and the very marginal climatic suitability would ensure that it never becomes a pest of any meaningful economic impact to the EU."	Comment was addressed by EFSA PLH Panel by pointing out that "although, when presented in a map of the EU as a whole, the areas at risk may appear to be small and fragmented, when only the citrus-growing areas of the EU are taken into account, the area predicted to be at risk constitutes a significant proportion of the EU citrus-growing areas"
32	C, D	"Our collective experience with CBS under field conditions gives us a high level of confidence in these assessments."	Comment was addressed by EFSA PLH Panel by stating that "the EFSA PLH Panel acknowledges the commenter's experience of the pathogen and the disease. However, the EFSA PLH Panel has identified key uncertainties in the epidemiology of CBS and made efforts to reduce these uncertainties, e.g. concerning the role of splash dispersal of pycnidiospores"
35	B	"we do not agree with the EFSA (2013)'s assessment of risk and we consider suitable expert opinion and scientific information to weigh strongly in favour of the no-risk assessment."	The EFSA PLH Panel merely replied here that "The EFSA PLH Panel disagrees with this comment," but the reasons for this disagreement were explained throughout the table
37	A	"we are in agreement with earlier PRAs, conducted by South Africa and USA, in which it was concluded that fruit is not a realistic pathway for CBS to enter and establishment"	Comment was addressed by EFSA PLH Panel, by clarifying that the EFSA PLH Panel assessment of the risk posed by *P. citricarpa* to the EU territory includes the evidence cited in the previous PRAs mentioned
40	A	EFSA PRA does not fully	Refers to reply to comment 30, where the

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		consider epidemiological evidence regarding the full set of events and conditions required for transmission of the disease to host plants	comment was addressed by the EFSA PLH Panel including a pathway analysis
41	A	List of necessary events for the successful transmission of *P. citricarpa* from infected plant material to new hosts:	Comment was addressed by EFSA PLH Panel, by agreeing that the introduction of *P. citricarpa* with infected plant material depends on the successful completion of a series of events and by pointing out that this issue has been addressed in the draft of the EFSA PLH (2014) Scientific Opinion on CBS. In addition, a simplified quantitative pathway analysis model was undertaken, experimental studies on pycnidiospores splash dispersal were performed, and new model simulations on the climatic suitability were carried out and included in EFSA PLH Panel (2014)
42	A	No clear distinction between the probability of entry and the probability that transmission of the pathogen will successfully occur resulting in establishment and disease development in a new location	Comment was addressed by EFSA PLH Panel, referring to section 2.2.1.5 of ISPM11
61	B, C, D	Various concerns on biology and life cycles	Comment was addressed by EFSA PLH Panel, by pointing out that: 1) fruit susceptibility was not evaluated in any of the studies highlighted in the comment received, 2) the papers from Ghana and Brazil are the only studies available in which fruit susceptibility was assessed under non-limiting conditions of inoculums, 3) studies on other leaf-spotting and fruit-blemishing fungal diseases of citrus, e.g. Alternaria brown spot of citrus, show that the period of fruit susceptibility is longer in cooler climates, 4) no studies on fruit susceptibility in conditions of continuous inoculums availability have been conducted in Argentina, Australia or South Africa, and 5) since six to seven months after fruit set was the longest period evaluated in all the studies available, longer periods of susceptibility cannot be excluded
62	C, D	Minimum temperature threshold for ascospore release and infection under field conditions	Comment was addressed by EFSA PLH Panel, by highlighting that the threshold of 18 ° C indicated by Fourie was derived from field studies, in which other limiting factors may be present
64	A, B, C, D	It cannot be assumed that all interceptions of symptomatic fruit are indicative of a viable spore inoculum source	Comment was addressed by EFSA PLH Panel, including in the revised version of the Opinion (EFSA PLH Panel, 2014) laboratory data from the interceptions at UK and Netherlands borders
66	B, C, D	The importance of rain-dispersed pycnidiospores in CBS infection levels	Comment was addressed by EFSA PLH Panel, by remarking that 1) the potential importance of pycnidiospores in new environments (such as

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
			semi-arid regions) cannot be discarded a priori, 2) splash dispersal should be considered in the context of entry, not of long-term epidemics, 3) spring and autumn rains may increase the importance of pycnidiospores in the Mediterranean area
67	A, C	Symptom expression dependence on fruit ripening vs. fruit infection periods	Comment was addressed by EFSA PLH Panel, by mentioning that the importance of both fruit phenology and environmental factors in symptom expression is recognized in the EFSA PLH Panel (2014) Scientific Opinion on CBS
68	B, C	CBS causing disease symptoms in the Eastern Cape	Comment was addressed by EFSA PLH Panel, by pointing out literature in disagreement with the comment received
69	A, D	PCR methods and accurate identification of *P. citricarpa*	Comment was addressed by EFSA PLH Panel, including additional laboratory data in the revised version
72	B, C, D	Reports of impact in the area of current distribution	Comment was addressed by EFSA PLH Panel, by reminding that, in the absence of fungicides, CBS strongly affects fruit quality
74	C, D	"Reis et al. (2006) did not report that fruit drop occurs in other parts of the world and EFSA (2013) has made an unsubstantiated extrapolation."	Comment was addressed by EFSA PLH Panel, by quoting directly from Reis et al. (2006): "Premature fruit drop due to black spot causes significant yield loss in Brazil, and probably in other citrus regions of the world". In the revised version, the reference Araújo et al. (2013) was also included. This study indicated that the yield of mature sweet orange trees in Brazil was reduced by 50% due to premature fruit drop caused by CBS (section 3.6.1)
82	A	APHIS indicates that in accordance with the USA CBS PRA (2010) citrus fruit is not epidemiologically significant as a pathway for the introduction of *G. citricarpa* or establishment of CBS disease.	Comment was addressed by EFSA PLH Panel, by noting that the US PRA was published a few months after CBS was detected in Florida. Moreover, the EFSA PLH Panel noted that, prior to CBS detection in Florida, the US authorities allowed the import of citrus fruit only from pest-free areas (which is a more restrictive measure than the current EU CBS-specific requirements)
83	D	Potential for establishment and spread in the pest risk assessment area	Comment was addressed by EFSA PLH Panel, by noting that in most countries fruit tree crops account for only a small proportion of the total area, and yet fruit tree crops are generally important ones. Moreover, the EFSA PLH Panel pointed out that EFSA Opinions do go through a peer review process before publication
84	D	Risk of establishment	Comment was addressed by EFSA PLH Panel
92	A	Living stages: identification	Refers to answer to comment 69, where this issue was addressed by EFSA PLH Panel, including additional laboratory data in the revised version
93	B, C	The meta-analysis and effectiveness of fungicidal control	Comment was addressed by EFSA PLH Panel, by underlining that, in some plots, disease incidence was only slightly reduced by the fungicide treatments
94	A, D	Viability of *P. citricarpa* during transport	Comment was addressed by EFSA PLH Panel, with reference to the paper by Er et al. (2013)
99	D	Microsprinklers and	Comment was addressed by EFSA PLH Panel, by

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		dissemination of *P. citricarpa* conidia	pointing out that the larger the drop size, the more effective is the dispersal of inoculums by water splash. Therefore, the potential of microsprinklers to contribute to the dissemination of *P. citricarpa* conidia can be similar to that of rainfall or dew
104	D	Transmission of the organism from the fruit to a suitable host	Comment was addressed by EFSA PLH Panel, by pointing out that the literature available does not deal with transmission from fruit
106	A	Inspections in different member states	Comment was addressed by EFSA PLH Panel. Details on inspection and detection were added in the revised opinion
110	A	Various comments related to interceptions	Comments were addressed by EFSA PLH Panel, by e.g. pointing out that PCR methods are available to differentiate between *P. citricarpa* and *P. citriasiana*. In some cases the same comments were addressed elsewhere in the same table
112	C	CBS fruit sensitivity of various citrus types to duration of exposure to inoculums	Comment was addressed by EFSA PLH Panel, by explaining that the text in the Opinion has been revised to reflect the fact that both fruit phenology and environmental factors are important in symptom expression, and thus in cultivar susceptibility
119	C	Probability of survival during transport or storage, with comment on the findings of Korf et al. (2001)	Comment was addressed by EFSA PLH Panel, by stating that Er et al. (2013) demonstrated that lesions and pycnidia developed in asymptomatic, latently infected fruit, even when maintained at 4° C. Therefore, the available scientific data indicate that the pathogen can survive in infected fruit under the cold temperature typically encountered during transport and storage
123	A	Some of the reported interceptions may be erroneous	Refers to answer to comment 69, where this issue was addressed by EFSA PLH Panel
125	A, C, D	Probability of transfer to a suitable host	Comment was addressed by EFSA PLH Panel, referring to the Perryman and West (2014) experiments, later published by Perryman et al. (2014)
128	D	Imports in the period September-October	Comment was addressed by EFSA PLH Panel, by reiterating that the previous EFSA PLH Panel (2008) Scientific Opinion on CBS indicated that in September and October there is the potential for pycnidiospore dispersal and infection. This aspect has been further analyzed in EFSA PLH Panel (2014)
130	A, C, D	Pathogen transfer as a critical step in the pathway	Comment was addressed by EFSA PLH Panel, referring to the Perryman and West (2014) experiments, later published by Perryman et al. (2014), as well as the simplified pathway model
135	A, B, C, D	Transmission of spores from the infected fruit to the host plant	Comment was addressed by EFSA PLH Panel, also referring to the replies to comments 64 and 66
137	A	Potential for intermediate distance transport of the pathogen by livestock and	Refers to response to comment no 11. This is not actually a criticism of the Scientific Opinion

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		wild animals has not been studied sufficiently	
139	C, D	Transfer from the fruit pathway to a suitable host or habitat	Comment was addressed by EFSA PLH Panel, by explaining that the issue has been further addressed in the revised opinion
140	A, C, D	Transfer and infection of susceptible plant tissues	There was only a partial reply by EFSA PLH Panel to this particular comment, but the comment was addressed elsewhere in the table, given the repetitive nature of the comments by Hattingh et al. (2013).
150	C, D	Transfer from the fruit pathway to a suitable host	Refers to answers to comments 46 and 77, where this issue was addressed by EFSA PLH Panel
151	C, D	On the probability of transfer to a suitable host	Comment was addressed by EFSA PLH Panel, by pointing out the Perryman & West (2014) splash dispersal experiments, the new simulations concerning pycnidiospore infection (section 3.2.2.5 in EFSA PLH (2014)) and the quantitative pathway analysis for the citrus fruit pathway
154	A	Identification of living stages of *P. citricarpa*	Refers to answer to comment 69, where this issue was addressed by EFSA PLH Panel
156	A	Inspections in different member states	Refers to answer to comment 69, where this issue was addressed by EFSA PLH Panel
164	A	Relationships between transport data and likelihood of transfer to host	Comment was addressed by EFSA PLH Panel, referring to the simplified pathway model
168	A	Viability of *P. citricarpa*	Refers to answers to comments 69 and 97, where this issue was addressed by EFSA PLH Panel
174	D	Likelihood that pycnidiospores from fruit on the ground will be splash-dispersed	Refers to answers to comments 64, 129, 130 and 173, where this issue was addressed by EFSA PLH Panel, also referring to the Perryman and West (2014) experiments, later published by Perryman et al. (2014)
175	D	Evidence that micro-sprinklers disseminate pycnidia	Comment was addressed by EFSA PLH Panel, among other things pointing out that "There may be a typographical error in this comment (dissemination of pycnidiospores, not of pycnidia)"
177	D	Whether pycnidiospores of *P. citricarpa* can be dispersed through aerosol spray	Comment was addressed by EFSA PLH Panel, by stating: "Please consult the study of Perryman and West (2014). This is the first study, conducted under controlled conditions, on splash dispersal of pycnidiospores of *P. citricarpa* from CBS infected citrus fruit"
178	A	Whether insects or birds play a role in spreading the CBS pathogen	Refers to answer to comment 136, where the EFSA PLH Panel agrees that these alternative means of dispersal of CBS should be investigated
181	A	Transmission of the pathogen	Comment was addressed by EFSA PLH Panel, referring to the pathway model
186	A	Role of pycnidiospores in causing new infections	Comment was addressed by EFSA PLH Panel, referring to the splash experiment
210	A	Probability of transfer to a suitable host	Comment was addressed by EFSA PLH Panel, by stating that the Opinion was updated in relation to the issues raised in this comment, i.e. climate suitability and splash dispersal

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
216	A, C, D	Entry pathway V: citrus plants for planting. The comment argues that information on earlier trade in citrus plants for planting from CBS-present South African areas to the Western Cape had been shared with EFSA	Comment was addressed by EFSA PLH Panel, answering that "the movement of plants from northern South Africa to the Western Cape is not documented. Other factors, such as host demography, should also be taken into account."
217	D	Role of pycnidiospores	Comment was addressed by EFSA PLH Panel, also referring to the reply to comments nr 3, 64, 66, 129 and 130
223	B, C, D	Ascospore dissemination over relatively long distances	Comment was addressed by EFSA PLH Panel, by explaining that the purpose of the Spósito et al. (2007) paper was not to estimate ascospore dispersal, but to determine whether or not diseased trees were spatially aggregated. As the origins of the spores were not given in that paper, it is not possible to estimate the minimum, mean or maximum distance of spore dispersal from the results reported in that paper
230	A, D	Conclusion on the probability of entry	Comment was addressed by EFSA PLH Panel, by making it clear that infection is not part of entry and is considered in the establishment section. Moreover, in the simplified quantitative pathway model (Appendix E), climatic suitability for pycnidiospore infection following a rain event is discussed in relation to entry and transfer
232	A, D	Comparison of entry conclusions with other PRAs	Comment was addressed by EFSA PLH Panel, by pointing out that the fact that interceptions still occur is evidence for the importance of this pathway, despite the sequential hurdles placed between the orchard and arrival in the EU, which include pre- and post-harvest treatments. This issue has been addressed in a quantitative way in the simplified pathway analysis
234	B, C, D	Periods of susceptibility of citrus leaves and fruits in the risk assessment area	Comment was addressed by EFSA PLH Panel, by stressing that all the studies indicate that fruit is susceptible for up to six to seven months
235	A, C	Pycnidiospores as source of potential infection	Comment was addressed by EFSA PLH Panel, by remarking that the importance of pycnidiospores in climatic conditions other than high rainfall tropical and sub-tropical conditions has not been evaluated
236	B, C, D	Ascospore release	Comment was addressed by EFSA PLH Panel, by reiterating that Fourie's is a field study, in which other limiting factors may be present, e.g. immature pseudothecia
237	C, D	Reference is made to the infection modelling conducted by Fourie et al. (2013). However, no mention is made of the findings that ascospore dispersal mostly occurred at temperatures above 18°C	Refers to answer to comment 62, where this issue was addressed by EFSA PLH Panel
238	B, C	Erroneous statement by EFSA that "pycnidiospores are	Comment was addressed by EFSA PLH Panel, by acknowledging the mistake

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		mainly disseminated by rain-splash (Whiteside, 1967)"	
247	C	Review of the different methods used to assess the climatic suitability of the EU for *P. citricarpa*	Comment was addressed by EFSA PLH Panel, by stating among other things that the multidisciplinary team constituting the EFSA PLH Panel has considerable experience in producing balanced risk assessments taking into account all published scientific evidence
250	C	Climate matching and correlative models	Comment was addressed by EFSA PLH Panel, by stating that the missing reference pointed out in the comment was added to the reference list
252	B, D	Adaptation of invasive organisms to novel environments	Comment was addressed by EFSA PLH Panel, by pointing out that the role of pathogen diversity in facilitating adaptation to new conditions is recognised by much of the literature in plant pathology
254	B, C, D	Advantages of CLIMEX as applied by Yonow et al. (2013)	Comment was addressed by EFSA PLH Panel, by explaining, among other things, with regard to the temperature threshold, that this is based on empirical field data from a specific location in South Africa. Dynamics of heat unit accumulation may be different in other regions, as may be the dynamics of ascospore maturation. Thus, this temperature threshold does not necessarily represent a biological feature of the pathogen
256	A	Establishment and the need to use a long-term perspective	Comment was addressed by EFSA PLH Panel, by pointing out that the inoculum and infection model was re-run accordingly
257	B, D	Use of CLIMEX	Comment was addressed by EFSA PLH Panel, by stating among other things that, contrary to the view of the CBS Experts Panel, when the EFSA PLH Panel applied the CLIMEX model parameterised for *P. citricarpa* by Yonow et al. (2013) with more recent climatic data, although most EU citrus-growing areas came out as having a "marginal" climatic suitability, important EU citrus-producing areas were classified as "suitable" and some areas were even classified as "highly suitable"
258	C, D	Nursery stock with latent CBS leaf infections	Comment was addressed by EFSA PLH Panel
259	B, D	Classification by Yonow et al. (2013) of EI values into categories of marginal, suitable and optimal	Comment was addressed by EFSA PLH Panel, by explaining that one reason why the EFSA PLH Panel criticised the classification of Yonow et al. (2013) is that, when the Panel ran the CLIMEX model parameterised for *P. citricarpa* by Yonow et al. (2013) using more recent climatic data, the result was that, although most EU citrus-growing areas came out as having a "marginal" climatic suitability, important EU citrus-producing areas were classified as "suitable" and some areas were even classified as "highly suitable"
260	C	On the CLIMEX modelling by Yonow et al. (2013)	Refers to reply to comment 62, where this comment 260 was addressed by EFSA PLH Panel
261	D	Disagreement with EFSA's (2013) conclusions that	Comment was addressed by EFSA PLH Panel, by referring to the response to comment 257

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		CLIMEX Compare Locations can provide misleading results for *P. citricarpa*.	
262	A, D	Analyses of climate suitability	Comment was addressed by EFSA PLH Panel, by declaring that agreement between two models does not mean they are both right or that one validates the other
263	A, D	Simulations of pseudothecium maturation and ascospore release	Comment was addressed by EFSA PLH Panel, by stressing among other things that Fourie's models also simulate *P. capitalensis*, which is already established in Spain
264	B, C	Infection simulations with the generic infection model of Magarey et al. (2005)	Comment was addressed by EFSA PLH Panel in a detailed manner, please refer to the report on the public consultation for details of the reply
267	D	"it would be interesting to analyse also the meteorological stations of the Spanish producer areas, considering the wide range con climatic conditions in different areas"	Comment was addressed by EFSA PLH Panel, by pointing out that the coverage of Spanish growing areas in the opinion has been done with interpolated climatic data provided by JRC at 25 x 25 km spatial resolution
268	C	Magarey et al. (2005) model	Comment was addressed by EFSA PLH Panel, by explaining among other things that the use by EFSA of a previous version of the generic infection model by Magarey et al. (2005) adds to the uncertainties in the sense that the results given in the opinion results might underestimate the number of potential infections
269	C, D	The relevance of pycnidiospores	Comment was addressed by EFSA PLH Panel, also referring to the replies to comments 16, 64, 66 and 214
270	C	Range of conditions detrimental to leaf litter as a substrate for ascospore inoculum over a long period	Comment was addressed by EFSA PLH Panel, by clarifying that further explanation of the leaf litter decomposition process has been added. However, data on the effect of environmental factors on citrus leaf litter decomposition rates are not available for citrus
271	C	Monthly prediction for ascospore dispersal and infection based on the models by Fourie et al. (2013) and Magarey et al. (2005)	Comment was addressed by EFSA PLH Panel, also referring to the replies to comments 269
272	B, C	Fourie et al. (2013) ascospore maturation and release models	Comment was addressed by EFSA PLH Panel, by noting that when extrapolating a model developed and evaluated in a specific location in South Africa to a completely different climatic area, it can happen that ascospore releases are predicted to continue in a second year. Again, it has to be remarked that the model includes the species *P. capitalensis*, which is already established in Spain
273	A, C, D	Low thresholds for the onset of ascospore dispersal used in EFSA's models	Comment was addressed by EFSA PLH Panel, pointing out that a request sent to South African authorities for data to improve these thresholds has not yet been answered
274	C	Criticisms of model parameter estimates	Comment was addressed by EFSA PLH Panel, by explaining that T_{min} is a parameter used in the

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
			Magarey infection model and is not related to release. The reader can find more details in the EFSA PLH Panel (2014) Scientific Opinion on CBS (page 83): "Fourie et al. (2013) indicated a threshold for ascospore release of 18 °C derived from ascospore catches in CBS-affected orchards in Limpopo Province, South Africa. This value represents the average temperature in this region when sufficient degree-days were accumulated for pseudothecia maturation. Kotzé (1963) demonstrated that ascospores can be readily released from mature pseudothecia over a temperature range from 5 °C to 25 °C.".
275	D	CLIMEX model parameterized to model the potential global distribution of the citrus black spot disease by Yonow et al. (2013)	Comment was addressed by EFSA PLH Panel, by noting, among other things, that once the CLIMEX model has been successfully parameterised by taking into account the species known responses to climatic variables, such as temperature, and its distribution, CLIMEX can then be run with a climatic dataset for the new area of concern or for different years or climate change in the same area
276	D	Further on EFSA's climate modelling	Comment was addressed by EFSA PLH Panel, by clarifying that the EFSA PLH Panel has not altered any model. What it did do was to make additional runs of the Yonow et al. (2013) model using different climate data and explore the outputs of the same model
292	A	Conclusions on the probability of establishment	Comment was addressed by EFSA PLH Panel, again pointing out that a request to South African authorities for data to improve this assessment has not yet been answered
293	A	Uncertainties on the probability of establishment	Comment was addressed by EFSA PLH Panel, by making it clear that even though the new results reduce the uncertainty concerning the presence of infection conditions in subsequent growing seasons, the main source of uncertainty remains the lack of knowledge on the relationship between inoculum pressure and disease incidence, as well as the lack of knowledge on the model parameter values describing the key bioclimatic requirements of *P. citricarpa*
294	A	Uncertainties on the probability of establishment	Refers to answer to comment 293, where this comment was addressed by EFSA PLH Panel
295	C	Probability of spread after establishment	Comment was addressed by EFSA PLH Panel, by noting that that it has not been possible to eradicate CBS from the semi-arid areas in the Eastern Cape in South Africa
316	D	Quality and yield losses over the areas affected by CBS	Comment was addressed by EFSA PLH Panel, by stating that although the introduction of CBS to a new area might be dealt with by good management practices, which will minimise impacts, the introduction of such a new citrus disease will increase the workload of farmers by making additional fungicide sprays necessary
317	A, D	Assessment of consequences,	Comment was addressed by EFSA PLH Panel, by

Com-ment no.	Hattingh et al. (2014)	Issue/Topic	Judgement about the appropriateness of EFSA PLH Panel reply to the comment received
		belittling of direct pest effects	also referring to the answers to comments nr 23 and 72, and by pointing out that, very recently, CBS has expanded from south to central Florida (USA)
324	A	Belittling of direct pest effects	Comment was addressed by EFSA PLH Panel, by reiterating that fruit blemishes affect quality standards for fresh fruit consumption. Moreover, currently no or a limited number of fungicides are applied in citrus orchards in the EU (and this under good agriculture practices and IPM guidelines)
327	A	Concern on the prediction of ascospore release in September - October.	Comment was addressed by EFSA PLH Panel, by remarking among other things that shifts in the periods of inoculum availability and host susceptibility depending on climatic region are reported for other diseases
328	C	First infection point and subsequent establishment from pycnidiospores on fruit	Comment was addressed by EFSA PLH Panel, by pointing out that there is also no indication in the literature that establishment resulted from infected plant propagating material
329	C	”Reference to Aguiar et al. (2012) is irrelevant since this work was not conducted under natural conditions”	Comment was addressed by EFSA PLH Panel, by explaining that the study of Aguiar et al. (2012) was conducted in controlled conditions, so it is not affected by limiting factors present in the field (e.g. susceptible fruit, but no inoculum available)
331	C	protective sprays in the September - October fruit cycle period	Comment was addressed by EFSA PLH Panel, by reminding the reader that this is the case only in South Africa
333	A, D	Meta-analysis of fungicide control	Comment was addressed by EFSA PLH Panel, by noting that, before the outbreak in Florida, the USA accepted fruits only from CBS-free areas (please also note that at the moment this regulation is still in place)
335	A	Indirect pest effects	Comment was addressed by EFSA PLH Panel, by referring to previous replies. This reply could have been more specific by also referring to the reply to comment 336, where this comment was addressed by EFSA PLH Panel
336	A, B	Indirect pest effects	Comment was addressed by EFSA PLH Panel, by declaring among other things that the Eastern Cape is a semi-arid area, where CBS is established and has not been eradicated. No published information has been found on the impact and control of CBS in Eastern Cape and information requested with regard to CBS impact and control in this area has not yet been provided to EFSA
338	A	Uncertainties on the assessment of consequences	Refers to answer to comment 336, where this comment was addressed by EFSA PLH Panel
380	A	Conclusions	Comment was addressed by EFSA PLH Panel, by clarifying that the opinion has been updated to include a more quantitative assessment of the citrus fruit entry pathway and of the climatic suitability of EU citrus-growing areas

References cited in Appendix A

Aguiar RL, Scaloppi EMT, de Goes A and Spósito MB, 2012. Período de incubaçao de *Guignardia citricarpa* em diferentes estádios fenológicos de frutos de laranjeira _Valencia‘. Tropical Plant Pathology, 37, 155–158.

Araújo D, Raetano CG, Ramos HH, Spósito MB and Prado EP, 2013. Interferência da redução no volume de aplicação sobre o controle da mancha preta (*Guignardia citricarpa* Kiely) em frutos de laranja _Valência‘. Summa Phytopathologica, 39, 172–179.

Bregaglio S, Donatelli M, Confalonieri R, Acutis M, Orlandini S, 2010. An integrated evaluation of thirteen modelling solutions for the generation of hourly values of air relative humidity. Theoretical and Applied Climatology 102, 429-438. doi:10.1007/s00704-010-0274-y

Bregaglio S, Donatelli M, Confalonieri R, Acutis M, Orlandini S, 2011. Multi metric evaluation of leaf wetness models for large-area application of plant disease models. Agricultural and Forest Meteorology 151: 1163–1172 doi:10.1016/j.agrformet.2011.04.003.

EFSA PLH Panel, 2014. Scientific Opinion on the risk of *Phyllosticta citricarpa* (*Guignardia citricarpa*) for the EU territory with identification and evaluation of risk reduction options. EFSA Journal 12(2): 3557 doi:10.2903/j.efsa.2014.3557.

EFSA, 2014. Outcome of the public consultation on the draft Scientific Opinion on the risk of *Phyllosticta citricarpa* (*Guignardia citricarpa*) for the EU territory with identification and evaluation of risk reduction options. EFSA supporting publication 2014: EN-555. 195 pp.

Er HL, Roberts PD, Marois JJ and van Bruggen AHC, 2013. Potential distribution of citrus black spot in the United States based on climatic conditions. European Journal of Plant Pathology, 137, 635–647.

Fourie PH, Schutte GC, Serfontein S and Swart SH, 2013. Modelling the effect of temperature and wetness on *Guignardia* pseudothecium maturation and ascospore release in citrus orchards. Phytopathology, 103, 281–292.

Hattingh V et al., 2014. Comments on the European Union Food Safety Authority’s Pest Risk Assessment for *Phyllosticta citricarpa*. Citrus Research International, accessed online September 2014 at http://www.citrusres.com/sites/default/files/documents/Comment%20on%20the%202014%20EFSA %20PRA%20final.pdf.

Korf HJG, Schutte GC and Kotzé JM, 2001. Effect of packhouse procedures on the viability of *Phyllosticta citricarpa*, anamorph of the citrus black spot pathogen. African Plant Protection, 7, 103–109.

Magarey RD, Sutton TB and CL Thayer, 2005. A simple generic infection model for foliar fungal plant pathogens. Phytopathology, 95, 92–100.

Makowski D, Vicent A, Pautasso M, Stancanelli G, Rafoss T, 2014. Comparison of statistical models in a meta-analysis of fungicide treatments for the control of citrus black spot caused by *Phyllosticta citricarpa*. European Journal of Plant Pathology 139, 1, 79-94.

Perryman SAM, Clark SJ, West JS, 2014. Splash dispersal of *Phyllosticta citricarpa* conidia from infected citrus fruit. Scientific Reports 4, 6568. doi:10.1038/srep06568.

Perryman SAM and West JS, 2014. Splash dispersal of *Pyllosticta citricarpa* pycnidiospores from infected citrus. EFSA supporting publication 2014-EN-560, 30 pp. Available online: http://www.efsa.europa.eu/en/supporting/doc/560e.pdf.

Reis RF, Timmer LW and de Goes A, 2006. Effect of temperature, leaf wetness, and rainfall on the production of *Guignardia citricarpa* ascospores and on black spot severity on sweet orange. Fitopatologia Brasileira, 31, 29–34.

USDA APHIS (United States Department of Agriculture Animal and Plant Health Inspection Service), 2010. Risk assessment of *Citrus* spp. fruit as a pathway for the introduction of *Guignardia citricarpa* Kiely, the organism that causes Citrus Black Spot disease. Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory, Raleigh, NC, USA.

Yonow T, Hattingh V, and de Villiers M, 2013. CLIMEX modelling of the potential global distribution of the citrus black spot disease caused by *Guignardia citricarpa* and the risk posed to Europe. Crop Protection, 44, 18–28.

Whiteside JO, 1967. Sources of inoculum of the black spot fungus, *Guignardia citricarpa*, in infected Rhodesian citrus orchards. The Rhodesia, Zambia and Malawi Journal of Agricultural Research, 5, 171–177.