

<b>Minutes of DIAROD WG4 Meeting</b>	
<b>Working Group 4. Identifying Research Gaps and Dissemination</b>	
<b>COST Action (FP1102)</b>	
<b>Action Title: Determining Invasiveness And Risk Of Dothistroma (DIAROD)</b>	
<b>Venue: Hotel Meritum, Staré náměstí 14, 160 00 Praha 6 - Ruzyně</b>	
<b>Wednesday 20<sup>th</sup> November 2013, 09:00 – 16:30</b>	

### Attendees

1	Anna Brown	UK	Chairperson of Action	
2	Mike Hale	UK	Leader of WG4	
3	Kath Tubby	UK	Deputy of WG4/ minutes of meeting	
4	Martin Mullett	UK	14 Jorge Martin Garcia	Spain
5	Emilia Ondruskova	Slovakia	15 Martti Vuorinen	Finland
6	Stephen Woodward	UK	16 Piotr Boron	Poland
7	Thomas Cech	Austria	17 Zuzana Heckova	Slovakia
8	Justyna Nowakowska	Poland	18 Tugba Dogmus Lehtijarvi	Turkey
9	Tomasz Oszako	Poland	19 Milon Dvorak	CR
10	Svetlana Markovskaja	Lithuania	20 Kateryna Davydenko	Ukraine
11	Nicola La Porta	Italy	21 Petr Kapitola	CR
12	Danko Diminik	Croatia	22 David Novotny	CR
13	Libor Jankovsky	CR		

### Apologies

23	Jan Stenlid	Sweden
24	Julio Diez Casero	Spain

### Morning Session: Research gaps

#### 1. Introduction (Mike Hale)

Mike Hale welcomed all the participants of WG4.

Topic of the afternoon workshop changed from Dissemination Options to Research Gaps

#### 2. Presentations from the chairs of the other WG's to feed into WG4

##### **Working Group 1** – Anna Brown (for Jan Stenlid)

WG1 held in Denmark. 26 members present. 4 talks given (from Czech Republic, Hungary, Lithuania and Norway). Now on DIAROD website in pdf form.

##### Training Schools:

- Molecular analysis of *Dothistroma* – all protocols now online.
- Population diversity of *Dothistroma* – e.g. microsatellite analysis. Training School for around 25 participants planned Feb 17<sup>th</sup>. Official invitations to be sent out soon. Grants will be available for attendance.
- Assessment and Monitoring – to standardise field assessment of dothistroma needle blight intensity. Mixture of field and classroom, May 2014 in UK

Database:

Discussed at WG 1 and 2. Aim to devise a central database to hold all *Dothistroma* records. Will be sent out to all for population.

### **Working Group 2:** Jorge Martin Garcia (for Julio Diez Casero)

Tasks within WG2 include influence of Climate Change (CC), Forest management, new pathways/dispersal, Interactions with other organisms.

#### *Option A: Review Existing data*

Lots of information available on impacts of CC (inc. new paper by Peredo on rainfall in Chile and *Dothistroma* on *P. radiata*), Management, lots of general papers on Pathways but only the EFSA report specific to DNB. *Re* Interactions – *Dothistroma* often found with other pathogens, but few specific studies. (but see Shaw on DNB and *Armillaria*, Garrido on DNB and *Russula*)

Redesign DIARDO publications list to include list of papers and grey literature, a contact name for each, links to an abstract or pdf where possible (mostly grey literature) - include English summaries where appropriate, use standard headings. Could link to journal articles (no copyright infringement – your institution would still need permission to access....), maybe links to 'last draft,' maybe 'keepers' of papers depending on copyright law,

Website to include a separate list of pdf files.

**Action:** all to supply any unpublished data from other countries

**Action:** all to collate own language grey lit, and summarise in English

**Action:** WG2 members to decide on standard template for files (target, published or not, etc.)

**Action:** all to send all papers/translations to Claire Holmes – [claire.holmes@forestry.gsi.gov.uk](mailto:claire.holmes@forestry.gsi.gov.uk) before next meeting. Kath Tubby to collate

**Action:** when literature collated Alex Woods to review climatic data? Lindsay Bulman to review forest management? Include information on Targets 3 and 4 in those reviews? E.g. include Pathways within Management (at landscape level)?

#### *Option B: Collection of new Data*

Problems include lack of resources for more sampling and use of Different Methodologies (but see proposed Training Day 2014). Bring in more partners to bring in more data e.g. Chile?

**Action:** members to provide feedback on standard methodology before training day to Jorge Martin Garcia

### **Working Group 3: Steve Woodward**

We have a list of apparent relative susceptibility, but almost all work on breeding, clonal etc. is done on *P. radiata*. Other data is anecdotal/possibly out of date/difficult to obtain e.g. Karadič in Belgrade -resistant provenances of *P. ponderosa*? E.g. Andrea in Hungary – resistant provenances of? Additional data from Bedgebury Pinetum in UK on single trees. Infected *Cedrus atlantica glauca* seen at Aberdeen meeting close to heavily infected *P. jeffrii*. Libor notes more and more findings on Norway spruce

Data gaps being addressed by Dphil students in UK – looking at SP, native provenances + some other specie (*P. nigra*, *ponderosa*, *contorta*), some difficulties with artificial inoculation although now have facilities to inoculate 150-200 trees depending on the growth chambers. Possibility of more funding to work on SP in UK.

COFFEE 10-1030

### 3. Overall discussion:

#### 3.1 Shared methodology –

##### **Molecular work:**

Molecular Training Day I. Basid identification, RAPD, RT-PCR. NB. ALWAYS INCLUDE A SET OF KNOWN ISOLATES to allow comparison with others' work. Protocols on DIAROD website.

Molecular Training Day II. Population analysis (microsatellites). Contact Irene Barnes if there's a need for more basic training

**Action:** Questionnaire to be sent out soon (Irene?).

**Assessment of disease severity:** Training day May 2014 UK. Protocol will be on web site

#### 3.2 Research gaps – to be discussed in afternoon Workshop

#### 3.3 User profiles – plus photograph to be entered onto web pages in standard form (to be decided)

#### 3.4 Photogallery – laboratory, field etc.

**Action:** Send photos to Claire Holmes. To be collated by Kath Tubby.

#### 3.5 Data repository –

Prototype geodatabase devised by Irene Barnes, Věra Tomešová, Reine Drenkhan and Martin Mullett – comprises multiple obligatory and optional/desirable entries with drop-down menus to encourage consistency of data entry.

Libor demonstrated the Czech Arc View geo-data base. Ultimately aims to link to other geo databases in CR.(e.g.topographical information)

More discussion needed from expert users on e.g. Grouping countries depending on prevailing environmental conditions. Possibility of bringing in Finnish modellers – Timo Pukkala, Timo Moykkinen

### 4. Overview of State Phytosanitary Administration (CR): Petr Kapitola:

Review of EU policy on *Dothistroma*, benefits and limitations. Relevance considering Europe-wide distribution of the pathogen. Thoughts on possible impact on spread of disease should regulations be removed.

Noted that outcomes of DIAROD would be very useful to European Commission and possibly to EPPO in devising appropriate strategies.

### 5. Overview of National Crop Research Institute: David Novotny

[http://www.vurv.cz/?p=index&site=default\\_en](http://www.vurv.cz/?p=index&site=default_en)

### 6. Correct naming of Doth

Please use *Dothistroma septosporum* (not *D. septospora*), and not *D. pini* if you are actually referring to *D. septosporum*. Do not use the sexual stage – *Mycosphaerella pini* unless you are talking specifically about the sexual stage.

Refer to the disease as dothistroma (not italicised) needle blight, abbreviated as DNB. Do not use the term red band needle blight, or RBNB anymore.

### 7. DIAROD Logo

Anna will send a choice with voting buttons

## Afternoon session: Dissemination of Information

### 8. Presentation: 'DNA structure of spruce and pine provenances in Poland' (Justyna Nowakowska and Tomasz Oszako)

See Nowakowsak, J. (2006). *Folia Forestalia* 48:27-44

RAPD and microsatellite analysis of *P. abies* populations reveals 2 natural migrations (north down and south up) post glaciation and unexpected mixing in supposedly natural plantations – German silvicultural activity ~ 100 yrs ago. *P. sylvestris* genotypic distribution also influenced by German silviculture in west Poland. Also presence of a Spanish haplotype! No apparent *Dothistroma* infection on *P. sylvestris*. (Anna Brown: Query timing and position of sampling as this seems unusual).

Authors offer up a large collection of genomic and mitochondrial DNA with possibility for STSM's/collaborative work on relevant endophytes, relationships between host genotype and resistance, diversity of stands and resistance....

### 9. Workshop – research gaps

Host	Environment	Pathogen
Are there useful resistance genes. Are they transferable	How long does <i>Dothistroma</i> infection remain asymptomatic after fungicide treatment	Origins of DNB
Are there any other endophytic fungi accompanying <i>Dothistroma</i> in conifer needles	What environmental conditions are needed for the sexual stage	Key factors (+/-) to facilitate spore germination
Do <i>Dothistroma</i> species exist in asymptomatic tissues of spruce and pine needles	Effects of host diversity at stand and landscape level	Symbiotic relationships with yeasts etc. helping survival
What is the relationship between <i>Dothistroma</i> presence and genetic structure of the host plant	Develop models to predict outbreaks	Pathogen virulence/pathogenicity in relation to genotype
Does the distribution of the <i>Dothistroma</i> spp depend on genetic structure of conifer stands	How long does the infection exist in the host before first symptoms occur	What is success? (for <i>Dothistroma</i> , numbers versus longevity vs host range)
Are there 'general resistance genes' e.g. chitinase, that could be used for resistance	More fungicide trials	Where is <i>D. pini</i> Where is <i>D. septosporum</i>
What controls symptom expression	Control using bio-fungicides	Are certain conditions influencing <i>D. pini</i> vs <i>D. septosporum</i> distribution
Will a resistance host recover if spore load is reduced	Control using plant stimulants	Is there selection of strains onto different host species
Does the host support beneficial competitors	Effects of travel of seedling material	Will <i>D. septosporum</i> and <i>D. pini</i> hybridise or compete
Are there individuals which escape symptom expression/infection. If so why/how	Disease assessments – standardising methods	
	Effects of movement of forestry machinery	
	Establish more spore traps	
	Effects of type of harvesting (e.g. clear-cut versus continuous cover)	

	Effects of ozone/other pollutants	
	Is the decline in SOX emissions responsible for increase in spread of disease	

These and FAQ to be entered onto DIAROD website - an opportunity for all to comment

## 10. Discussion – DIAROD and special edition of Forest Pathology

**10.1** Steve Woodward (Editor in chief) presented possibility of a special issue, 8-10 reasonable length review papers on *Dothistroma* spp. One from each WG, or more? Data from geodatabase can be used to generate a good European perspective on DNB. (NB. Only other special edition has been on white pine blister rust – about twice size of normal journal).

**10.2** Other options - all grey lit gathered together in a book?

**10.3** Produce country-specific guides.

e.g. template = UK basic field diagnosis guide for UK practitioners, including other pathogens typically found alongside *Dothistroma*. e.g. formulate guides on assessing disease intensity, different management options (e.g. mixed species planting, initial spacing, thinning, brashing etc.) including lots of photos.

**Action** – Anna Brown to circulate link to UK publication.

**Action** – WG4 Leaders to concentrate a session on this at the next meeting to finalise some layouts following Training Days. Management guide probably aim to do last.

**10.4** encourage STSM publications

## 11. AOB and Coffee

Discussed format/timing of 2014 meetings – joint WG plus workshops with talks, plus 4 individual WG's or 2 big meetings plus the 2 training schools etc.

Possible collaboration with Fraxback for final meeting –or collaboration with the forthcoming *Fusarium circinatum* meeting.

## 12. End

Mike Hale summarised the meeting, thanked the speakers and closed the meeting at 16:30.

**13.** Tour of nearby institution – cancelled