DIAROD Working Group 2: Universidad de Valladolid, Palencia campus

30 October, 2013

Hosts: Julio Diez Casero and Jorge Martin Garcia

Present:

Anna Brown (Chair of DIAROD)
Julio Diez Casero (Host)
Jorge Martin Garcia (Host)
Alejandro Solla
Martin Mullett
Tugba Dogmus Lehtijarvi
Zuzana heckova
Martti Vuorinen
Libor Jankovský
Jelena Lazarevic
Nikoleta Soulioti
Kath Tubby (minutes)

Introduction to Morning Session (AB and JDC)

Julio DC - Welcome to Palencia.

Introductions from all

Theme of WG2 – Dothistroma septosporum and the environment. Emphasised WG2 critical to the DIAROD Action as the environment is a critical driver in influencing levels of infection. Can we allow trees to manage themselves within their environment, reaching a balance between host and pathogen? European experiences vary e.g. UK Dothi inoculum levels so high, seeing high tree mortality in P. contorta spp. Latifolia, previously 'resistant' species (e.g. P. sylvestris) becoming susceptible. So trees have to be managed to obtain marketable crop.

Reviewed where WG sits within DIAROD and feeds into objectives. WG2 encompasses Task3 – 'Influence of environment on DNB'

Julio DC sees 2 Options:

Option A – review data

Option B – collect new data

Objectives of the meeting:

1. Begin preparing reviews
2. Try to arrange collection of necessary data - divide up tasks, standardise methodology

Presentations/updates by WG members

1. Kath Tubby (UK)

Overview of management related research carried out in UK. Update on thinning trials – significant, and long-lasting reductions in mortality and sustained increases in yield associated with heavy thinning. Also, an overview of recent aerial spraying trial using copper oxychloride. Data collection w.r.t. persistence of product on foliage/in soil still on-going.

2. Nikoleta Soulioti (Greece)

D. septosporum only found In Greece only in 2 areas in the north, arising from an introduction maybe from imported American stock in the 1950's. Infection currently found at low levels on *P. brutia* and *nigra*. These are important, natural forests – possibly why previously been very resistant/resilient. These findings summarised in Tsopelas *et al* paper written in collaboration with Fabi. Could be a useful site for WG2 studies, but will be problems collecting environmental data as no meteorological stations close by, and Greece suffering greatly w.r.t. austerity measures. Fire considered much more significant than pests/pathogens and budgets extremely limited.

3. Jelena Lazarevic (Montenegro)

Montenegro is 60% forest, v varied topography and climate. 8 native pines, but these only form around 4% of total forest area. *D. septosporum* found on *P. nigra* in 1986. Described by Karadic (at that time countries unified). Only the anamorph known in Montenegro.

Copper fungicides used in Serbia when infection over 40% of crown. Use every 3rd yr in 5-20 yr old plantations at beginning of May and beginning of June. Also protects against *Sphaeropsis sapinea* (SS) or *Diplodia pinea*. Considerable mortality seen when combined infections of SS and *Dothistroma*.

Chemicals not used so much in Montenegro as plantations comprise smaller areas. Dothistroma apparently not problematic in nurseries. Infection currently lower in Montenegro than it has been – possibly because of changes in age-structure, changes in rainfall or and an increase in temperatures? Differences in incidence of disease between the species, and across the country. Would be interesting to focus on the higher altitude sites to see what is going on there.

Some question over what is affecting *P. heldrechii* (Balkan pine)– not a commercially significant species, but important ecologically.

Libor: questioned presence of Brown spot. Karadic found in Serbia, but no recent information – present in MNE? Requested English translation of Karadic paper on Dothistroma finding in 1985

Break for coffee 10:30

Overview of WG2: Jorge Martín García

Targets under Task 3: Climate, Changes in forest management, New pathways and dispersal, Interactions with other pathogens e.g. *Fusarium circinatum*.

Target 1: Influences of Climate

Are needle pathogens more responsive to climate change (CC) than other pathogens (Kliejunas 2011) because sporulation and infection strongly associated with changes in temp and precipitation?

Note that DNB can tolerate many different climates (watt et al 2009, 2011)

Warm wet spring/summers increase DNB outbreaks (many authors)

CC certainly a hot topic wrt plant diseases, all IPCC scenarios predict increases in temp, extreme precipitation events. (Jorge illustrated DNB expansion under a range of IPCC scenarios)

Target 2: Influences of forest management

Using the local (Spanish) Management as a template:

Forestry tends towards monocultures, even aged, short rotation. Priorities – wood production, wildlife, mushrooms, fire. Pests & diseases v low priority.

Widely recognised species diversity better for forest health, but even diversity at a landscape level is beneficial if can't implement diversity at stand level. Thinning still conducted wrt production rather than plant health. Understorey removal carried out to reduce fire, but too expensive to do over large areas. Overall, problems communicating forest health benefits of alternative management strategies to managers. Some manipulation of provenance used to reduce susceptibility e.g. proportion of susceptible pine should not exceed 20% in high risk areas.

Nb Heinmann paper – DNB decreases with increasing pine intensity!

Fertilisers not found to be useful in reducing infection here (see Bulman 2008. Contreras, ##). Copper could be but EU Regulations make it difficult. Also a lot of small private plantations so aerial spraying not possible.

Target 3: Pathways

1.Artificial

EFSA (PRA 2012) identifies live plants as most important. Liebhold 2012, santini 2013 reviews

2.Natural pathways

Conidia commonly disperse up to 300m Gibson 1964. Airborne up to 160km Gibson, lilja et al 2011 – Estonia-finland

3.Host plant and material not for planting – branches etc. for christmas

A possible pathway. Increasingly significant – biomass. Branches and foliage used for pellets and transported widely.

4.Infected needles carried on host plant product (machinery, shoes etc.)

EFSA considers minimally important, although machines tend not to be disinfected – **are we (DIAROD) convinced it is a minimally important pathway?**

Target 4: Interaction with other organisms

Dothistroma often found alongside *Lophodermium*, *Lophodermella*, *Cyclaneusma*, *Diplodia*, *Fusarium*.

Nb. Garrido et al., 1982 - trees with ectomycchoryzae of Russulaceae not attacked by *Dothistroma*. Artificial media trials using extracts looked promising.

General Discussion

Discussion on current data availability and format of reviews (i.e. 1 review or 4 to represent the 4 tasks)

Anna B. –

a.collate/update known data. Some v accessible – journals etc. easy to do. Martin Mullett putting together a review on environmental impacts which will be useful. Can he help make available the grey lit, esp climatic stuff from NZ (Action: Martin M). Jorge G. - apparently has good list of articles on interactions with other pathogens (Action: Jorge G to send references to KT for web site)

(Action: ALL to forward DNB references to KT)

b.collate less accessible literature – MAKE US AWARE of your own-language papers. Need partners to create English summaries (partners responsible for accuracy!), add English keywords, and then add to a larger lit review

Action Point : ALL participants summarise and forward to KT

Action Point: AB to check availability of funds for full translation of key papers.

c. grey lit – finally get all of our internal review stuff accessible. (Action: ALL collate own grey literature and send to KT)

d. structure – Geo database already being drawn together by WG1, and WG2 can feed into it. Get some 'must have fields set up' E.g. species affected, chemicals tried, climatic data for the area, over lay climate maps. Think about structure of database – linked tables? (Action: ALL to consider structure and fields)

e. field studies – everyone can get involved in the above but a subset can collect more field data

Overall Action Points

Action Point: ALL - Everyone in the COST ACTION (not just the WG members). Collate all literature (unpublished data, internal reviews) in your own language, create English summary where appropriate.

Action Point: Claire to email all participants asking for info. Will request a fairly standard template – e.g. word count for paper summaries, file format. 'P' for published, 'G' for grey literature, Email of lead author etc. (to be decided)

Action Point:

Target 1 – Alex woods or Lindsay Bulman. Pull together the literature as outlined above before next meeting. (Not necessarily polished but noted, and questions/gaps formulated where necessary

Target 2 -Kath T collate as above

Target 3 – Jorge G collate as above

Target 4 – Mike H collate as above

Possibility to use web site as a portal being discussed.

Afternoon Session

Julio DC: Possibilities for research to feed into WG2 (Julio DC's Option B)

12 countries expressed an interest in further sampling after the Brno questionnaire.

1.Define objectives (e.g. Effect of tree variables on DNB, Climatic variables, Soil, Stand variables)

2.Choosing methods/decide on scales of assessment:
e.g. Countries for sampling, # stands per country, variables at stand + tree level, Forest health variables – use ICP Forest classifications (e.g. crown density), or more detailed Canadian assessment of foliation at different nodes. NZ and Canada use helicopter assessments (maybe not possible in Europe because of stand density), NZ infection assessments on individual tree basis, DNB forest health variables (Canadian, NZ, UK methods of disease assessment), Forms/cards for field sampling, Statistical analyses, What climatic variables (software to interpolate climate between met stations), Edaphic factors

[Anna B – UK experience on sampling. Stratify sampling in areas with early infection to ensure whole stand covered., Disease can be v patchy in early stages. Where established 1, 2 or 3 transects OK depending on stand area as disease can be quite homogenous.]

In Summary: ….we need a common methodology to assess DNB versus environment

Discussion

Anna B – Facilitate use of standard assessment techniques via a Training Day (limit to around 30 people). Propose May 2014, UK, Bedgebury Pinetum. COST will bring Lindsay over. Run through NZ, UK/Canada stand assessments, predominance in young trees. Aim to write a short paper on the diff host spp. We want feedback on which techniques to concentrate on.

Action Point: Claire to send out email asking participants about their current assessment protocols

Action Point: core group of trainers decide on methodology before training school (e.g. AB, LB, AW??)

Anna B - for past work previous severity monitoring will be allocated a score, but everything from this point on aim to use same protocol.

Jorge MG – common methodology allows common statistics to some extent. Problems if data scattered across soil types or spp. AB: May want to group countries as will be commonalities in species e.g. group UK, Finland, CR. Soils perhaps less of an impact. So first step find out which countries have DNB on which species, then group accordingly.

Anna B – *re* scale of assessment. NZ and UK assess many stands to help target spraying/premature felling. For this research project each country decide on number of stands – doesn't' have to be huge, aim to cover a geographic range.

Martin M –Note that some of these data are being collected for the WG1 geodatabase. The added benefit here is the climatic variable. So we need to integrate the WG's. Do the surveys, but feed into both, satisfying all data requirements.

AB reviewed the geodatabase for WG1, with intention to set it up to answer both. Some basic info, with optional add-ons. For WG2 more on methodology. Can still add in older data, but newer data can be more sophisticated. Add-ons could include source of data (e.g. from a paper),planting density, thinned/un-thinned, aspect, slope, pruning/brashing, chemical control (fungicide or vegetation), other foliar pathogens already in, add deer - include as other stress factors, climate – possibly in a sep dataset cos of format and size, Link to records – AB. i.e. 1st table of compulsory data, 2nd table linked with optional extras, 3rd table with climate data? Martin M has been working on a glossary and instructions to help users input data in the same format.

Database should give a European perspective used to generate our papers. WG4 can discuss where/how - some of the data collection, input and analysis could be done by STSM's

Action Point: AB already updating the geodatabase requirememts from WG1. Will send out with minutes.

Other Business:

Discussion about dissemination of results - leave to WG4, but mentioned a book or copy of forest path on DNB, or both. Greyer literature would add to a book – maybe a country break down, history etc. template for each country. Maybe an E-Book. Action Point: all participants to email Kath T or Mike H your thoughts on dissemination for WG4, or attend the meeting!

STSM's: Jorge MG and Tugba DL are the leads now. Topics arising from this meeting advertise on website. Make it more proactive and have some set targets. Review a way to push research gaps at WG4. If lots apply (>5) we'd probably get more money from COST.

Location for next WG meeting:

Better to have just 2 groups a year where all WG meet. Spring and autumn meetings? Turkey in the autumn, so spring for WG's? Helena in Portugal?

Summary Julio

Try to find all the useful grey lit. Summary in English around 200 words?

Action Point: Anna B to send out link for Drop Box in next 2 weeks

Action Point: Julio DC to send out proposal for file format for literature

Action Point: Anna B send out dates for training school soon, in negotiation with Lindsay. Then start deciding on methodology.