

Expert Panels on Meteorology and Phenology

Combined workshop/expert meeting of the Expert Panels on Meteorology and Phenology
"Meteo-Pheno workshop 2000", in Lousã, Portugal, 18-21 October 2000

D R A F T (13.12.2000)

Minutes

1. The Combined "Meteo-Pheno workshop 2000" was held from 18 to 21 October 2000 in the "Centre of Technical Forestry Operations" (COTF) in Lousã near Coimbra in Central Portugal, and hosted by the Portuguese Direction General of Forests (DGF). It was attended by 24 experts for forest meteorology and for forest phenology from 13 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Portugal, Slovak Republic, Sweden and United Kingdom, see annex 1), including the representative of the European Commission/FIMCI, the chairman of ICP Forests and members of the Expert Panels on Crown Condition Assessment and on Growth and Yield.
2. Mr. Preuhsler (chairman) welcomed the Expert Panels and introduced Mr. Beuker as the co-chairman for Phenology and proposed Mr. Jensen as co-chairman for Meteorology for the workshop, and explained and proposed the agenda. The proposals and the agenda were adopted (see annex 2).
3. The chairman described the tasks of the workshop:
The Expert Panel on Meteorology met in 1996 for preparing the installation of the sub-manual "Meteorological Monitoring on Intensive Monitoring Plots"; the Expert Panel on Phenology met in 1997 and 1999 to discuss and develop the sub-manual "Phenological Observations", a technical sub-group on Phenology met in 1998 and worked out the technical annex for it.
The combined "Meteo-Pheno workshop 2000" is for both Expert Panels the first meeting after the installation of the manuals and has the aim to discuss for both Level II surveys
 - experience in the application of the sub-manuals
 - sufficiency of methods, equipment and data
 - first approaches for combined use of meteo and pheno data
 - contributions of the Expert Panels Meteorology and Phenology to other surveys
4. After a short overview on the Level II programme in Portugal by the representative of the Portuguese Direction General of Forests (Ms. Maria Barros), the chairman of ICP Forests (Mr. Haussmann) and the representative of the European Commission (Mr. Vel) reported on results of the internal review of the level II programme and on trends and strategies for the future of the programme, with special importance on the meteorological and phenological parts of it. Recent trends in respect of global change and biodiversity were pointed.

(Summaries of the presented papers and posters during the workshop are collected in the Proceedings in annex 5)

5. Mr. Jensen reported on the results of the questionnaire about Meteorological measurements, circulated to all NFC's in Summer 2000. A blank copy of the questionnaire Meteorology together with some statistics of the answers to the questions are given in Annex 3. Only 9 countries of 32 returned the questionnaire, a 10th reply from Germany was not received in time due to e-mail problems and therefore is not included in the statistics.

The participants presented experience and problems with lack of Meteo data for European interpretation (Mr. Vel), spatial data extrapolation (Mr. Jensen), special methodological aspects of the meteorological measurements in forest (Mr. Mindas, Ms. Merilä), data base structure and harmonisation (Mrs. Houston, Mr. Andreae) and use of meteo data for meteo based key parameters (Mr. Raspe). Abstracts of these presentations are included in the proceedings.

The in-depth discussion with respect to the meteorological monitoring showed the need of a greater number of Level II Meteo-stations in under-represented areas of Europe, of more complete Meteo-data series, and some necessary points for review and updating of the manual.

The manual should be revised at a number of places. From the answers to the questionnaire it is clear that there is a demand for better guidelines about how to select/describe sites. Some of the problems were pointed out in the presentation given by Mr. Jensen (see the abstract in the proceedings). One recommendation is that, if it is not possible to have the meteo station at the actual plot, it is more important to have it located in a terrain similar to the actual plot (like on a similar slope facing the same direction) than to have it as close as possible. This is especially true for the occurrence of „max/min temperatures“ and the „near zero wind speeds“ which are associated for frost effects.

The discussion about the spatial extrapolation of data focused on: Is it possible to use data from some of the plots and model/predict the rest?

No, stick to the data we have and try to analyse conditions for the relevant plots only.

Yes, if you just want long term means and if you are not going to study /explain specific processes.

Non-stand data are useless for in-stand predictions.

However some guidelines about extrapolation are necessary in order to include Level I plots in the analyses.

A paragraph in connection with "external data" and about examples of what type of investigation need in situ data and what type can also use "near by" meteo (in general investigations, where only longer term averages are required i.e. monthly or seasonal means) needs to be included

It was also pointed, that there were factual errors in the manual: E.g. one form is missing (section 6), the definition of wind directions and what is meant by daily values (what period: 0-23 or 6-5 etc.).need more precise definitions.

The sub-manual needs to be revised.

Soil humidity is an important parameter, but the necessary equipment (Time Domain Reflectometry or TDR) for automatic data recording is relatively expensive (order 5000 euro). A problem is further more that it is necessary to have several systems because of the variations in soil water with depth and distance from trees. TDR measurements could be compared to throughfall measurements (much cheaper, and in many places already existing because of deposition work) and some simple form of an evaporation model. However general results are probably difficult to obtain because the throughfall depends on the canopy architecture. Another problem related to soil humidity is the snow melting process. It is even quite difficult to assess the amount of snow present on the forest floor.

Another discussion point was quality assurance (Q/A) and quality control (Q/C) of the data. For QA/QC two strategies are mentioned, which in a way represent two completely opposite strategies: manual check of all data once a week, replacement of instruments if errors/inconsistencies are found; and automatic replacement once per year of all instruments with "new" calibrated ones. In any case the documentation of the measurements should include details about the instruments, their calibration, installation, maintenance, and the data management.

Perhaps the manual should reflect this more in order to provide countries with good instructions on how to document and carry out meteo measurements.

A term which is very frequently used both by FIMCI and the expert panels is "Evaluation". This is a bad term with a co-notation of "to see if you like it or not". It should be replaced with QA or QC if that is what is meant to distinguish it from the use of the data to correlate/explain the observed effects on the trees. In the future we should avoid the word "evaluation". It is too confusing. Sometimes it means an assessment of the quality/validity of the collected data material. At other times it means the use of one data set (e.g. meteo) to explain variations in other observations (e.g. pheno) or in other words to establish cause-effect relationships. Use quality assurance or quality control (QA/QC) in the first case and terms like interpretation, application or presentation in the second.

Concerning the use of and the access to the data the discussion brought up several opinions and questions, e.g.: Is it worth while to create general access to the database rather than giving out the data separately on an individual basis (French solution). Other countries obliged to give out data to anybody because being in the public domain (e.g. UK).

A final advice was that Expert panels should contribute with ideas and initiatives to a systematic use of the collected data. The most first type of initiatives of the Expert Panel should focus on the use of meteo data in order to explain the phenological observations made.

6. Mr. Beuker reported on the results of the questionnaire Phenology, circulated at all NFC's in Summer 2000. A blank copy of the questionnaire Phenology together with some statistics of the answers to the questions are given in Annex 4. Also in this field only some few countries returned the questionnaire

The participants presented phenological trends in general (Mr. Costa), first results and problems of already assessed simple phenological observation (Mr. Ulrich), the use of phenological observation on plot level (Mr. Durrant) and a current project of remote phenological assessment using digital cameras (Mr. Beuker). Abstracts of these presentations are included in the proceedings.

The phenological in depth discussion pointed out once again the importance of what for the data are going to be used:

The simple extensive phenological observation on the stand level of the plot (biotic and abiotic damage and simple timing of phenophases) is already successfully done in some countries by the staff for the technical service. It needs in average not more than 5 to 10 Minutes for the weekly cursory examination of the plot stand. These extensive observations are sufficient in order e.g. to define the length of the growing season, or to get a general idea of what is going on in the plot.

For all kind of modelling, however, exist the clear need of high frequency data of the intensive phenological observation. This is necessarily to be done by well trained staff (e.g. forest engineer) on up to 20 individual trees of a level II plot and needs about 20 Minutes per observation term; additional measures at permanent girth bands at these individual trees need about 20 Minutes more. The intensive part of the manual might have become too much a compromise for to get sufficient participation; at the workshop it was suggested to make the intensive observations "really intensive" in order to provide data better suitable for the modelers. The experts agreed that the data from the first assessment years of the (intensive) phenological observations should be analysed and published as soon as possible, with the aim to demonstrate the possibilities and the importance of these data as well as their request for further co-operation with other Expert Panels; and by that to cause the interest of more countries in assessing phenological observations on Level II plots.

In the new regulations phenology and its importance for the Intensive monitoring programme should be pointed out in a more clear way.

The forms for Phenology need to be improved to be less complicated and better obtained. The sub-manual needs to be revised. The aim is to get at least new forms legal by end 2001-beginning 2002.

In order to improve the observations additional illustrations of phenological phases are necessary. They will be included in a new Pheno-website, which will be installed by Mr. Beuker.

7. In respect of the already integrated use of meteo, pheno and other data the paper presentations focussed on e.g. the definition of vegetation periods and seasons (Ms. Menzel, Mr. Raspe), the combination of litter fall and pollen data with phenological observations (Ms. Thomsen) and the experience on litterfall and LAI estimation (Mr. Cutini). Also abstracts of these presentations are included in the proceedings.

The indepth discussion pointed out, that sectoral interpretation of the single surveys at level II plots are necessary basic steps, which include data control, plausibility checks, quality assurance in general, the completion of data time series and the documentation of the data.

To follow the main aim of explaining cause-effect-relationships in various aspects of forest ecosystems, the integrated use of (all) data of the monitoring programme is demanded. The approach of the Meteorology and Phenology part of the programme is an indispensable first step on this way.

Besides that exist already many request on data and on standardised functions/models for e.g. defining and calculating derived parameters like Summer index, Heat index, Frost index, terms of growing season. (an overview of such definitions, tested for the application at for Level II data, is given in the Annex 3)

In the future it will be necessary to organize more often back to back meetings and joint workshops with members of various Expert panels, like the planned ad hoc working group on "Litterfall" and on "Biotic damage".

8. An excursion to the Portuguese Level II plot "Serra da Lousã" allowed indepth discussion concerning location and instrumentation of the meteo part and the closely connected deposition part of the programme. The visit of a nearby long term forest research plot series rose up the importance of cooperative use of results of Level II plots and other research work and survey - not only in a strategic sense.
9. The Expert Panels agreed on the following steps:
 - * Abstracts of the paper presentations and of the poster will be printed as proceedings of the workshop and will be added as annex 5 to the minutes.
 - * With the distribution of the minutes in January/February 2001 all European Countries will be requested again to answer until 15 April 2001 the once more, together with these minutes, distributed questionnaires for Meteorology and for Phenology. The results concerning all European countries should be presented at the 17th Task Force Meeting of ICP Forests in Mai/June 2001.
 - * the minutes and the outcome of the workshop will be distributed also to those experts, who participated at the former EP meetings.
 - * An overview of the most important current key parameters concerning Meteo and Pheno will be prepared by Mr. Raspe and presented in the proceedings of the workshop at annex 5 of the minutes.
 - * The NFC's are encouraged to test the usability of external Meteo data from e.g. national Meteo/weather networks/services and to report to the Expert Panel about availability of data, of costs, of comparability etc.
 - * The NFC's are encouraged to do snow measures and to contribute with their experience at the next Expert Panel meeting
 - * The other Expert Panels of the Intensive Monitoring Programme are encouraged to explain their interest on specific Meteo and Pheno information
 - * The Mr. Beuker will install a web page as Pheno communication platform and an upscaling tool, including recent publications concerned.
 - * At both manuals some addaption is necessary, some paragraphs need improvement (e.g. instrumentation, import of external data, restrictions, quality control). The Expert Panels

will propose to the 17th Task Force Meeting of ICP Forests the preparation of an upscaling of both sub-manuals.

* The members of the EP Meteorology and Phenology are encouraged to be active with the ad-hoc working groups on Litterfall and Biotic damage, which will have workshops at beginning of 2001

10. At the end of the meeting the participants warmly thanked Mr. João Fernandes, as representative of the Direcção-Geral das Florestas in Lousã, and as the head of the "Centre of Technical Forestry Operations", and his team at COTF - namely Donna Mimi and Sr. Mario - for kind hosting the meeting and the excellent arrangements there, Sr. Sérgio and the head of "bombeiros" for impressive presentation of the fire defense problems in Portugal, and the portuguese colleagues and members of the Expert Panels, for the excursions into the forests of Serra da Lousã and Marinha Grande and to Old Town and University of Coimbra, and the driver of the bus Sr. Orlando Filipe for very well driving and finding the best way to the interesting points.

P.s.; not for the final Minutes

The draft minutes of the workshop will be prepared by the chairman and the both co-chairmen and will be circulated by e-mail to the participants before 15 December 2000. Comments may be sent to the chairman (Mr. Preuhsler, Freising, Germany) by mail, fax or e-mail until 10 January 2001.

The revised version will be circulated to the participants and all members of the Expert panels of Meteo and Pheno, to the NFC's, the European Commission and to ICP Forests, by mid of February 2001.

Annex 2 to Minutes "Meteo-Pheno workshop 2000", Lousã/ Portugal, 18 - 21 October 2000

**Pan-European Programme for the Intensive Monitoring of Forest Ecosystems (EU/ICP Forests)
Combined Workshop/Expert Meeting of the Expert Panels on Meteorology and Phenology**

Agenda

Wednesday, 18 October 2000

- 13:30 Departure by bus from Lisbon airport
- 16:30 Arrival at COTF (Centre of Technical Forestry Operations) in Lousã, near Coimbra
- 17:30 - 18:15 **Opening session**
- Opening by the chairman of the EP Meteorology and Phenology
 - Opening address by the representative of the host country Portugal
chairman of ICP Forests
representative of the European Commission
 - Adoption of the agenda, technical instructions
 - Maria Barros, Portugal
The Level II programme in Portugal
- 18:15 - 19:00 **Session 1: The Level II programme and its future development**
- Evert Vel, EU and FIMCI
Results of the internal review of the level II programme and trends for the future
 - Thomas Haußmann, ICP Forests
Strategy of ICP Forests for the period of 2001 - 2006
- 19:00 - 20:00 Dinner
- 20:00 - 22:00 **Continuation of Session 1**
- Niels Otto Jensen, meeting co-chairman Meteorology
Report on the questionnaire Meteorology
 - Egbert Beuker, co-chairman Phenology
Report on the questionnaire Phenology

Thursday, 19

October 2000 07:30

Breakfast

- 08:30 - 09:45 **Session 2: Meteo Level II - Missing Data**
- Evert Vel, Gerd Jan Reinds, FIMCI, The Netherlands
Lack of meteo data at calculations on european level by FIMCI
 - Niels Otto Jensen, Denmark
Spatial extrapolation of Meteorological data
- 09:45 - 12:30 **Session 3: Meteorological Monitoring on Intensive Monitoring plots** (chaired by Mr. Jensen)

Paper presentations

- Jozef Mindas, Slovakia
Methodological aspects of meteorological measurements in forest ecosystems
- Päivi Merilä, Finland
Struggling with meteorological and phenological monitoring in Finland
- Tracy Houston, United Kingdom
Concept, structure and application of the national/local database for the Level II programme in the UK, with special importance on meteo and pheno data

- Henning Andreae, Germany
German ideas on methodological documentation and harmonization within the Level II-Subprogramme "Meteorology"
- Stephan Raspe, Germany
Identification of meteo based key parameters

12:30 - 13:30

Lunch

13:30 - 14:45

- Mr. Sergio, Forest Administration Lousã, (at the nearby field-airport)
Forest fire defense in Portugal

14:45 - 19:00

Session 4: Phenological Observation on Intensive Monitoring plots (chaired by Mr. Beuker)

Paper presentations

- José Costa, Portugal
Phenological trends in Portugal
- Erwin Ulrich, France
Simple phenological observations in the RENECOFOR network from 1997 to 1999
- David Durrant, United Kingdom
Phenological measurements - biotic damage and litterfall
- Egbert Beuker, Finland
Remote assessments of phenological events using digital camera

Discussion points

- Technical experience
 - * plot level observation (biotic/abiotic damage, stand phenology)
 - * individual tree observation (intensive phenological monitoring)
 - * additional techniques and data (e.g. girth bands, litterfall, other data)
 - * quality assurance
- Pheno data calculation and presentation
 - * description of events and pheno phases
 - * variety inside of stands, among plots, among species
- Review of the manual

19:00 - 20:00

Dinner

20:00 - 22:30

Session 5: Use of the Meteo and Pheno data in Europe

- Evert Vel, FIMCI
Meteo and Pheno data forms and data transmission to FIMCI
- Thomas Hausmann, ICP Forests / Josef Herkendell, EU
Interest on Meteo and Pheno data for projects at European level
- Evert Vel, EU
Planning EU-projects and financial possibilities for it

----- Friday,

20 October 2000

07:30

Breakfast

08:30 - 09:2:30

Continuation of Session 3: Meteorological Monitoring (chaired by Mr. Jensen)

Discussion points

- Technical experience with the Meteo-stations

- * instrumentation, measurement equipment and data storage
- * data preparation, missing data, data submission, national data base
- * quality assurance
- Meteo data calculation and presentation
 - * local/national basic calculations
 - * use of other meteo data
 - (e.g. external data, interpolation, interpretation, transferfunction)
 - * meteo based key parameter (e.g. ecosystem function, stress,...)
- Review of the manual

09:30 - 12:30 **Session 6: Integrated use of meteo, pheno and other data for combined interpretation**

Paper presentations

- Annette Menzel, Germany
 - Meteorological and phenological definition of the vegetation period
- Stephan Raspe, Germany
 - Calculation of the vegetation season using meteo data
- Iben Margrete Thomsen, Denmark
 - Correlation between phenological observation and other parameters (litter fall and pollen data)
- Andrea Cutini, Italy
 - Experience on litterfall and LAI estimates using LAI 2000 (LI-COR) from Italian intensive monitoring plots

12:30 - 13:30 **Lunch**

13:30 - 19:00 Excursion to the Portuguese Level II plot "Serra da Lousã", and to the nearby series of 22 plots for "Mixed Species Natural Regeneration Research", in "Cantão das Hortas", Forest Administration of Lousã

19:00 Dinner

20:00 - 22:00 **Continuation of Session 6: Integrated use of Meteo, Pheno and other data**

Discussion points

- Combined Meteo-Pheno data use
 - * e.g. definition of vegetation period
 - * e.g. national and NFC's cooperative calculations
- Links to other Level I and Level II survey
 - * Crown Condition, Growth, Deposition, Foliar
 - * Contribution of the EP Meteorology/Phenology to other working groups
 - litterfall (France, December 2000 or spring 2001)
 - biotic damage (Belgium, early spring 2001)
 - biodiversity (to start in 2001)
- Integrated calculation and interpretation
 - * case studies of Level II and others
 - * application on Level I
 - * sufficiency of Level II data
- Recommendations to other Expert Panels of EU/ICP Forests

22:00 - 22:30 **Closing session**, final statements

Saturday, 21 October 2000 07:30 Breakfast

08:00 - 20:00 **Bus travel back to Lisbon**

On the way: Visit of Botanical Garden, University and old town of Coimbra, of Batalha, of the old *Pinus pinaster* sand dune afforestation area Marinha Grand, of wind effects on forests at Sito/Nazare, and of old town Obidos.

Poster presentation during the workshop

Tiziana Amoriello, Andrea Costantini, Italy:

Meteorological stress factors of Italian Forest Ecosystems

Egbert Beuker, Finland:

Remote Assessment of Phenological Events using Digital Cameras

Miklos Manninger, Hungary:

Girthband measurements

Stephan Raspe, German:

Effect of early summer drought on Mg-nutrition of base poor spruce sites

Arnold JH van Vliet, R.D. de Groot, The Netherlands:

European Phenology Network

Annex 1 to Minutes "Meteo-Pheno workshop 2000", Lousã/ Portugal, 18 - 21 October 2000

Pan-European Programme for the Intensive Monitoring of Forest Ecosystems (EU/ICP Forests) Combined Workshop/Expert Meeting of the Expert Panels on Meteorology and Phenology

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