

IPC - WP on diseases

Activity Report November 2012- June 2014

<u>Chairperson:</u>	Mrs. Marijke Steenackers (Belgium)
<u>Vice-Chairpersons:</u>	Mr. Y.P. Singh (India), Mrs. Silvia Cortizo (Argentina), Mrs. Edilene Machado Buturi (Brasil)
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i) Activities and outputs programmed at IPC-2012, Dehradun

1. Continue the update of the membership list of active researchers in poplar and willow diseases to be added to the Directory of Poplar and Willow specialists to the IPC website
2. Report on poplar and willow selection and breeding programs for disease resistance in the world
We will update the database of diseases of poplar and willow from different stakeholders
Further we will make an inventory of all (active or previous active) selection and breeding programs for disease
3. Develop an action plan for improving selection and breeding programs for resistance to diseases in developing countries
It's a common fact that clonal forestry of poplar is based on limited number of clones. This monoclonal culture with a very narrow genetic basis is very suitable for development of epidemics. Breeding for disease resistance is a practical approach, friendly to low income growers both on its low financial investment and high ecological benefits.
However, for the success of the resistance breeding, identification of target disease(s) is essential in terms of its wider presence, adult plant nature (preferably plantation disease) substantial losses, etc.
Moreover, pest-resistant clones offer hope for poplar cultivation as agrochemicals are not eco-friendly and biological management is still poorly practiced for various limitations. A breeding program for resistances should have interdisciplinary interfaces with genetics, conservation and improvement, production system and environment applications, so that resistant, productive clones may be deployed in the field that are also capable to mitigate the carbon loss due to diseases.

The WP will develop an action plan, based on the ground realities in poplar growing countries (like India, Argentina, Iran and Brazil) which can be used as a model for similar climatic situations in developing countries.
The outcome will be a report that will be posted on the IPC-website.
4. Organize a WP meeting, concurrently with the next Session of the Executive Committee, to be hold in Vancouver, July 2014.

ii) Activities and outputs achieved (degree of achievement)

1. Continue the update of the membership list of active researchers in poplar and willow diseases to be added to the Directory of Poplar and Willow specialists to the IPC website

The list of researchers active in poplar and willow pathology and breeding and selection for disease resistance was updated after the WP meeting in Dehradun, which was attended for the first time by pathologists and breeders from India, Argentina, China and Nepal.
Activity 2. (see below) will also allow to extend the membership list towards researchers involved in poplar and willow breeding outside Europe.

2. Report on poplar and willow selection and breeding programs for disease resistance in the world

An inventory of selection and breeding programs of poplar in Europe, based on the outcome of the EU-project Treebreedex, has been compiled. Most programs include selection for disease resistance as one of the main selection criteria. A questionnaire has been sent around to all these breeding institutions in order to provide a list of dangerous pathogens and the protocols used to select for resistance, including reference genotypes for each of the protocols. This inventory will now be extended to willows and to non-European countries. Based on the national reports produced for the IPC 2012 meeting in Dehradun, breeding programs from non-European countries could be identified. A questionnaire will be sent around to those countries in order to complete the list of harmful pathogens and selection procedures used for resistance breeding worldwide.

3. Develop an action plan for improving selection and breeding programs for resistance to diseases in developing countries

- The main objective of the WP of diseases is to assist in developing improved forest material with a reasonable level of tolerance by discussing and exchanging selection and breeding strategies for durable disease resistance. This includes the development of protocols to reduce the risk of introduction of new pathogens into new areas by importing reproductive material (cuttings, seeds).

The question to set up an action plan for improving selection and breeding for disease resistance, raised during the management meeting of the WP of diseases in Dehradun, 2012. Although in several countries, new plantations of poplars are increasing rapidly, the number of clones used is often very restricted. Moreover, plantations are installed with introduced poplar clones from foreign breeding programs, without previously screening these clones for resistance to local diseases. Very often epidemics emerge because of lack of knowledge of the local pathogens and of the damage they can cause to the new poplar clones, especially on monoclonal plantations.

During the visit of poplar plantations in the plains of Northern India it became clear that poplar cultivation in this area is an example of poplar cultivation based on a very restricted number of introduced poplar clones, almost all belonging to one poplar species *Populus deltoides*.

After recent discussions with researchers at the Forestry Research Institute from Dehradun, it was decided that the WP on diseases will describe the actual situation in Northern India and use it as basis to set up a detailed action plan to:

- (1) evaluate the status of nursery and plantation diseases on commercially viable clones;
- (2) study the biology, diversity, succession of the most prevalent pathogen(s); and
- (3) screen the disease resistance of promising clones under natural and controlled conditions.

These studies have the objective to select resistant genotypes for breeding and clonal propagation and to investigate the genetics of the host-parasite relationship. The research program should also focus on biological control of pest populations in the field by agents native to India.

The output will be a project description emphasizing the importance of pathology and disease resistance studies before starting up large scale poplar plantations and could be used to attract money from the local governments to support such a research project.

The proposed project should have interdisciplinary interfaces with genetics, conservation and improvement, production system and environment applications, so that, resistant, productive clones may be deployed in the field that are also capable to mitigate the carbon loss due to diseases.

4. Organize a WP meeting, concurrently with the next Session of the Executive Committee, to be hold in Vancouver, July 2014.

It has been decided to postpone the WP meeting to the next Session of the International Poplar Commission in 2016. By that time, reports described under 2. and 3. will be available for presentation to members of the WP.

iii) Difficulties encountered and corrections suggested

Marijke Steenackers announces that, because she has been charged with new obligations at INBO, she is no more in a position to effectively guide the works of the Working Party of Diseases. However, Mauritz Ramstedt, actually secretary of the WP, kindly accepted to become the chairperson of the WP of diseases for the next 2 years. Marijke will however continue to support the WP of diseases as secretary of the WP.

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