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**THE INTERNATIONAL COMMISSION ON POPLARS AND OTHER  
FAST-GROWING TREES SUSTAINING PEOPLE AND THE  
ENVIRONMENT (IPC)**

**Twenty-sixth Session**

**5- 8 October 2021**

**SYNTHESIS OF IPC WORKING PARTY REPORTS (FULL REPORT)**

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## I. WORKING PARTY ON TAXONOMY, NOMENCLATURE AND REGISTRATION

*Activity Report: July 2018- September 2020 & Action plan 2020-2022*

Chair: Julia KUZOVKINA (University of Connecticut, USA)

Technical Secretary: Lorenzo VIETTO (CREA Research Centre for Forestry and Wood, Italy)

### Introduction

The International Poplar Commission of the FAO holds the International Cultivar Registration Authorities (ICRAs) for the genera *Populus* (poplars, cottonwoods and aspens) and *Salix* (willows).

The ICRA system operates under the *International Code of Nomenclature for Cultivated Plants* (ICNCP) and is responsible for ensuring each plant cultivar receives a unique, authoritative botanical name. The chief aim is to prevent the duplicated uses of cultivar epithets within a genus and to ensure that the naming follows the latest edition of the ICNCP. The system is voluntary and non-statutory, and it does not grant any legal protection over the name or the plant. Legal protection should be sought through national Plant Breeders' Rights or Plant Patents. However, registering cultivar names ought to be considered as a vital system of knowledge and classification, on par with any other internationally accepted standards of nomenclature.

The ICRA produces and maintains lists of names and other relevant information about the cultivars that are already registered in the public domain and it makes these lists available to the international community as a free service, free of any commercial interest. All individuals or institutions that intend to release new cultivars should send an application to the IPC providing essential information regarding the origin of the cultivar, a synthetic description and a proposed denomination. After verifying that the proposed denomination is in line with international rules and that the accompanying information corresponds with registration guidelines, the new cultivar is then included in the International Register of Cultivars.

### Activities achieved during the 2018-2020 period:

Activity 1 – Continue the update of the *International Register of Populus Cultivars* and *The Checklist for Cultivars of Populus*.

- a) *The International Register of Populus Cultivars* was updated in 2020 with five new cultivars, registrations for which were submitted in 2018. A few new cultivar registrations are currently in preparation (Green Wood Resources, US). The International Register currently maintains 363 cultivar epithets.
- b) *The Checklist for Cultivars of Populus* (commercial names, synonyms or experimental codes) has been updated; it contains 488 unregistered names and 103 experimental codes (unnamed) entries. Thirteen new cultivars have been released and provisionally registered in the Italian National Register of Basic Materials in 2019; these clonal varieties have been selected by private companies but no request to register their epithets to the Register has been received by the IPC Working Party.
- c) A Checklist for poplar cultivars for ornamental uses contains eighty-two cultivars (sixty of which are already included in the *Checklist*).
- d) An extensive 6-year (2013-2019) report regarding the data on *Populus* cultivars was submitted to the Special Commission for Cultivar Registration of the International Society for Horticultural Sciences in March 2020. The Working Party received positive feedback from the Commission.

Activity 2 – Initiate *The International Register of Salix Cultivars* and continue the update of *The Checklist for Cultivars of Salix*.

- a) *The International Register of Salix Cultivars* was initiated in July 2020. Twenty-six new cultivar names have been registered during 2018-2020 and included in *The Register*. The detailed registration files (cultivar descriptions/registrations, images of the herbarium standard specimens and color photos) are available at the OSF (Open Science Framework) website: <https://osf.io/6cpey/>. This website allows for uploading, managing, sharing and organizing large files into the folder (each cultivar name represented by a separate folder). The link to *The Register* will be uploaded to the IPC website in preparation for the next session.
- b) To publicize the new registrations of *Salix* cultivar names to the widest appropriate audience a peer-reviewed manuscript “*International Registration of Cultivar Names for Salix L. (Willow) in 2016-2020*” by Y. Kuzovkina and L. Vietto was accepted and will be published in *HortScience* in the fall of 2020.
- c) A new edition of *The Checklist for Cultivars of Salix* is almost completed and will be published in the summer of 2021. Its current version contains 968 name records. This edition will include the most recent taxonomic revisions, 113 new cultivar names with descriptions and 22 new references.
- d) The Virtual presentation by P. McGovern, J. Kuzovkina, R. Soolanayakanahally “IPC Online *Salix* Database Proof of Concept” was presented at the “Short Rotation Woody Crops Webinar Series” hosted by the University of Minnesota via the [Next Gen Poplars Project](#) on August 12, 2020. The manuscript outlining this concept is currently being prepared for the Special Issue “Growth and Development of Short Rotation Woody Crops for Rural and Urban Applications” and will be submitted by the end of 2020.
- e) As with *Populus*, an extensive 6-year (2013-2019) report regarding the data on *Salix* cultivars was submitted to the Special Commission for Cultivar Registration of the International Society for Horticultural Sciences in March 2020.

Activity 3 – Raise awareness

Effective outreach efforts directed towards all those involved in cultivar development and facilitation of the comprehensive compilation of international records were the focus during 2018-2020.

- a) To further raise awareness about the importance of cultivar registration among interested parties, the IPC Working Party on Taxonomy, Nomenclature and Registration made a presentation describing the current work and cultivar registration goals. The abstract was published in the Proceedings of the conference:

Kuzovkina, J. and L. Vietto. The International Cultivar Registration Authorities (ICRAs) for *Populus* L. and *Salix* L. Seventh International Poplar Symposium 28 October-4 November 2018. Buenos Aires, Argentina. p.26.

- b) A few breeders (Stig Larsson and Bo Gertsson, Sweden; Brian Stanton, Greenwood Resources, USA) contacted us with their updates on cultivar names and registrations.

#### Activity 4 – Maintain a network and update the portal

The Working Party continues to maintain an integrated network with breeders and outreach to all organizations involved in domestication programmes, which are fundamental for the development of the international database.

- a) In July 2020 received the National Reports (through Benjamin Caldwell). Eighteen reports were reviewed to extract information related to the new cultivars of *Populus* and *Salix*. A few countries (China, Sweden and Germany) were identified as preparing new cultivars registrations. These countries will be contacted by our Working Party next summer with the request to provide the updated records and registrations for the *Registrars*.

### **Programme of Work for the next two years 2020-2022**

#### Activity 1 – Continue the update of the *International Register of Populus Cultivars* and *The Checklist for Cultivars of Populus*.

#### Activity 2 – Initiate *The International Register of Salix Cultivars* and continue the update of *The Checklist for Cultivars of Salix*.

Our goal is to get all new names into the system and make this information available to the international community. The Poplar and Willow Checklists are valuable sources of information to inform breeders about existing names, which help to avoid duplicate names for new cultivars.

#### Activity 3 – Raise awareness

The main focus during 2020-2022 is to continue the direct contacts with Poplar and Willow breeders to obtain more detailed and updated information about registered and new cultivars.

The members of the Working Party are made aware of any new cultivars being developed and the breeders are then contacted about these plants once they have been selected. The Working Party will continue to focus on extracting data from the National Country reports, which will be submitted to the IPC during 2021, and contacting countries that have indicated the development of new cultivars.

To publicize the new registrations of *Populus* cultivar names to the widest appropriate audience we are planning to publish a manuscript with the new names of *Populus* cultivars in a suitable Journal, such as *Biomass and Bioenergy*.

#### Activity 4 – Maintain a network and update the portal

The Working Party will continue to maintain an integrated network with breeders and reach out to all organizations involved in domestication programmes, which are fundamental for the development of the international database.

- a) Due to the expanded mission of the IPC, as per the IPC Convention and the inclusion of new plant genera which are considered to be fast-growing trees, the Working Party will review the list of the additional plant genera and make recommendations for the appropriate cultivar registration mechanism.

The following 16 woody genera were listed as fast-growing trees of interest (extracted by Ben Caldwell from the national reports in September 2020):

*Abies* (Fir)  
*Acer* (Maple)  
*Alnus* (Alder)  
*Betula Alnus* (Birch)  
*Eucalyptus* (Eucalyptus)  
*Fraxinus* (Ash)  
*Juglans* (Walnut)  
*Larix* (Larch)  
*Morus* (Mulberry)  
*Paulownia* (Paulownia)  
*Picea* (Spruce)  
*Pinus* (Pine)  
*Prunus* (Cherry)  
*Robinia pseudoacacia* (Black locust)  
*Quercus* (Oaks)  
*Tilia* (Linden)

- b) Discuss and explore the mechanism for possible interaction and collaboration with the Working Party on Domestication and Conservation of Genetic Resources to expand the network and raise awareness about the importance of cultivar registration.
- c) Continue the production of a new series of publications '*Name Changes Alerts*'. This series of Fact Sheets translate and interpret the science of nomenclatural and taxonomic changes made by taxonomists and convey information in the language accessible to the widest possible audience.
- d) The Working Party internet portal was extensively updated in 2016. In the summer of 2021 new documents and publications will be uploaded to include the most recent materials and publications relevant to the work of the Working Party.

## II. WORKING PARTY ON DOMESTICATION AND CONSERVATION OF GENETIC RESOURCES

*Activity Report: October 2020 – 2022 & Action plan 2020-2022*

Teresa CERRILLO(Argentina), Chair

Ian MC IVOR (New Zealand), Vice-chair

Sasa ORLOVIC (Serbia), Vice-chair

Ann Christin RONNBERG-WASTLJUNG (Sweden), Technical secretary

### Introduction

The WP2 was established to contribute to better knowledge and information exchange that is ultimately aimed at the domestication and conservation of genetic resources of poplars and willows. More recently, the mission was extended to other fast-growing trees.

The WP2 focuses on issues concerning:

- a) Genetic improvement by different means: classical breeding, development and application of genomic tools and genetic transformations.
- b) Creation of new cultivars for different applications: wood for structural uses, bioenergy, phytoremediation, waste-water treatment, restoration, pulp and paper, basket making.
- c) Conservation of natural genetic resources and ecosystems.
- d) Specifically, in the context of adaptation to climate change, promotion of the development of strategies concerning genetic breeding and conservation programmes to select genotypes capable of coping with future climate change.

### Progress with the activities 2018-2020

The major focus of work in the WP in the past period has been on:

- a) Progression in the update of the database about the poplar and willow breeding programmes in the world.
- b) Creation of a database of researchers and experts involving domestication and conservation of poplars, willows and other fast-growing trees and genetic resources (initial stage).
- c) Interaction with WP on Taxonomy, Nomenclature and Registration: Checklist of the *Salix* spp collection in CREA-Casale Monferrato, Italy and in INTA-Delta del Paraná, Argentina; collaboration between Lorenzo Vietto and Teresa Cerrillo (in the interinstitutional agreement CREA-INTA, signed in November 2018).

Some other comments, with the involvement of WP2 members:

- a) Technical meetings to training workshops for managers of poplar and willow nurseries, for producers and industrialists (who adopt the new improved materials), for land use planning consultants, with technical advisory groups that contribute to the review of the research programme and seminars for students of forest sciences (New Zealand, Argentina).

- b) Collaboration with the Seventh International Poplar Symposium of IUFRO. Organization of the willow study trip. October 28 – November 4, 2018. Buenos Aires, Argentina.
- c) Publication of a new manual for nursery managers in August 2020, by the research team; the first time a national publication for nursery managers has been released (New Zealand).
- d) Publication of the *Salix viminalis* genome in Sweden (Almeida et al. 2020).

Breeding programmes show some changes, extensions or updates in their objectives or directions, expanding to other applications and genetic materials:

In **New Zealand**: their targeted uses include soil stabilisation on slopes and along riverbanks, shelterbelts, wood products, and pollen production. New Zealand, like most countries, is experiencing an increase in the frequency and severity of both regional droughts and significant rainstorms, seasonal difficulty in establishing new trees vegetatively, and new incursions of insect pests. The most recent insect incursion is the poplar sawfly, *Cladius grandis*, first detected in January 2019. Its effect has been limited so far. It follows the incursion of the giant willow aphid, *Tuberolachnus salignus* first detected in 2014 and has caused the death of many mature willow trees protecting riverbanks (Sopow et al, 2017).

In **Serbia**: there is now more focus on plant susceptibility to diseases and phytoremediation (Pilipović et al, 2020).

In **Sweden**: a new research programme (Future Fit Salix) has started (2020 - 2023) for willows, a collaborative programme between the Swedish University of Agricultural Sciences and the breeding company Lantmännen lantbruk. Within this programme, wood traits important for the conversion to biofuels are introduced as breeding goals. The aim of the programme is also to develop selection models for use in the genomic selection of willows. Since 2016 three new willow varieties have been released by the breeding company Lantmännen lantbruk that are all different types of hybrids between the species *Salix viminalis*, *S. schwerinii*, *S. eriocephala* and *S. aurita*. The company European Willow Breeding has also released three new varieties since 2016.

In **Argentina**: collection, diversity studies, and genotype propagation of *Salix humboldtiana* are the first stages to domesticate and integrate the only native South American willow species into the breeding programme. The adoption of six poplars (*Populus deltoides* and *Populus x canadensis*) and seven willow clones is in process. Five of these willow cultivars are multipurpose (for structural uses of wood, pulp and paper and environmental applications): hybrids: *Salix matsudana* x *Salix alba*; *Salix matsudana* x *Salix nigra*, and individuals obtained by open pollination of *Salix matsudana*, *Salix alba* and *Salix nigra*. Another seven selected clones are in technology transfer processes (Cerrillo et al, 2019). Four willows were also selected for basketry (*Salix viminalis* and *Salix viminalis* x *Salix caprea*), planted for the first time in large plots, and the technology transfer process began. Non-destructive methodologies are being developed by INTA researchers to study the structural characteristics of the wood of willows and poplar, to apply them as predictive strategies in the breeding programmes.

### Other comments

- a) Concerning the activity of the WP

The interaction of experts and researchers involved in genetics can be intensified and help connect them with benefits in their research and generate agreements. In this sense, the databases developed and in process by the WP can be useful. We hope to promote a closer cooperation between WP and users of the improved material, in each country, as an effective alternative to improve and accelerate the application of clonal materials, through the exchange of experience and knowledge.



b) Concerning (domestication and conservation of genetic resources) breeding programmes in the world:

Some difficulties and challenges have been observed for several breeding programmes:

- i) Often, there are difficulties to have enough sources of financing to sustain the programmes in the long term and reductions in technical human resources are reported, with insufficient renewal to contribute to the programmes. Considerable time is committed to seeking additional funding, but long-term breeding programmes find it difficult to be supported with continuity, and competition is intense between indigenous and exotic woody species for the current uses. Important efforts are made so that researchers can attend congresses and technical meetings, often with public-private collaboration; in this sense, the support provided by the organizations of the last three IPC sessions is remarkable, since they allow the attendance of researchers and experts from member countries.
- ii) Adoption of new and improved material: adoption processes are often slow. In this sense, it is relevant to have integrated and collaborative work with industries and other potential adopters, before the release of the improved material, who could test improved materials for their processes on a larger scale. In addition, it is necessary to intensify the work of professionals dedicated to forestry extension together with researchers.
- iii) In several countries: there is limited adoption of poplars and willows, with inefficient usage in comparison to the potential usages the wood could provide, often due to the low diffusion of knowledge regarding the physical and mechanical properties of the wood. It is important to promote poplar and willow as valuable commercial species because of the wood and its products.
- iv) Clone adoption takes a long time, it is important to design propagation strategies while the newly selected clones are being achieved. That is, when the improved material is released, propagation material on a certain scale should already be started.
- v) Promotion of the improved material must be targeted at increasing biodiversity within the planted material as a buffer against climate change.

**Programme of Work for the next two years 2020-2022**

Continue with consensual activities:

- a) Database on poplar and willow improvement programmes.
- b) Database of researchers and experts involved in domestication and conservation of poplars, willows and other fast-growing trees and genetic resources and
- c) Interaction with WP on Taxonomy, Nomenclature and WP Registry.

In keeping with the broader scope of the IPC, extended to other fast-growing species, WP2 will consider including other breeding programmes of forest trees (so far poplars and willows) to update the database.

### References

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### **III. WORKING PARTY ON SUSTAINABLE LIVELIHOODS, LAND- USE, PRODUCTS AND BIOENERGY**

*Activity Report: July 2018- September 2020 & Action plan 2020-2022*

Joris Van Acker, Chair

#### **Foreword (Report 2018-2020)**

The International Commission on Poplars and Other Fast-Growing Trees Sustaining People and the Environment (IPC), is a treaty-based body placed within the framework of the FAO. Its mission is to reduce poverty and facilitate the production of ecosystem services worldwide by fostering the sustainable management of fast-growing trees.

The IPC supports research and management activities through six international, cross- disciplinary working parties dealing with:

Taxonomy, Nomenclature and Registration;

Domestication and Conservation of Genetic Resources;

Plant Health, Resilience to Threats and Climate Change;

Sustainable Livelihoods, Land-use, Products and Bioenergy, Environmental and Ecosystem Services;

Policy, Communication and Outreach.

This Working party is based on an earlier merger of the Working Party on Harvesting and Utilisation of Poplar and Willow Wood, the Working Party on Production Systems. The Working Party on Sustainable Livelihoods, Land-use, Products and Bioenergy is specifically dedicated to the forestry-wood industry chain of fast-growing trees like poplars and willows. It is indeed a combination of the previously indicated working parties on production systems and on harvesting and utilisation of wood.

#### **Activities and outputs (Report 2018-2020)**

In the below paragraphs several topics are discussed concerning the activities and outputs for the period 2018-2020:

##### Organizational structure

###### *a) Networking*

At the last meeting in Berlin (25th Session of the International Poplar Commission, 13-16 Sep 2016) interest in this working party was expressed by a considerable group of international experts. Furthermore, there is an important interaction with industrial networks like Pro-Populus in Europe.

###### *b) Regional network managers*

Based on info received over the past year and completed by 2018-19, a list of experts interested in this working party was established. Besides the Chair it is the intention to provide in several Vice-Chairs and one Technical Secretary. The reason for the Vice-Chairs was to accommodate global participation and to share the workload. The Working Party Chairperson, Vice-Chairpersons and the Technical Secretary will be redefined to strengthen regional networking for China, Asia, Latin America, North America, Africa and Europe.

c) *A new WP Executive*

A new WP executive will be installed after further consultation.

d) *Update Global Directory*

An update of Experts relating to this Working Party on Sustainable Livelihoods, Land-use, Products and Bioenergy need to be updated to enable interactions and communication on working party-specific topics and tasks.

*Research and development*

a) *Organising meetings/workshops/conferences*

An update of Experts relating to this Working Party on Sustainable Livelihoods, Land-use, Products and Bioenergy need to be updated to enable interactions and communication on working party-specific topics and tasks.

b) *State of the art database*

Earlier there was an attempt to create a database dealing with publications related to harvesting, utilisation and product properties. Starting from the content of the FAO/IPC Book “Poplars and Willows in the World” it can still be an objective to come to an update on the state of the art knowledge related to this working party. So, the plan remains to prepare a database of publications related to harvesting, utilisation and forest products properties as well as on production systems.

c) *Initiate new research, R&D*

This topic will evolve from the improved networking and might need a boost from a young scientist who could be motivated by a specific state-of-the-art database.

d) *Writing of the Utilisation Chapter of “Poplars and Willows in the World”*

The FAO/IPC Book “Poplars and Willows in the World” could do with some updating related to this Working Party. The proposal is to work with complementary information made available on the website and plan for future publications related to innovation and trends.

e) *Organise a Scientific/Technical Conference*

Organise a dedicated workshop/conference on technical aspects of producing wood products derived from fast-growing species, including topics on harvesting and utilisation as well as aspects of sustainability, which could be organised back-to-back with other conferences (e.g. International Poplar Symposium).

f) *Initiate new international collaborative R&D projects*

Examine current research and initiate new priority research collaborative projects to advance the utilisation of fast-growing wood species (e.g. comparison of biomass for energy with other forest products options). We still envisage setting up a support system for young scientists and students (Ph.D. and post-graduate) with grants for short-term scientific missions, conference participation, etc.

### Membership

#### a) Support young scientists

There remains a need for a support system for young scientists (Ph.D. and young postdocs), e.g. grants for short-term scientific missions (STSM), support for conference/session participation.

#### b) Compiling country-based information

The WP Executive of the Working Party on Harvesting and Utilisation was very keen on identifying the key poplar/willow industry in the different IPC active countries. This intention might be expanded to all aspects relevant to the current working party.

### Focus and outreach

#### a) Update the Working Party's web page

Better use will be made of the IPC Working Party website to inform members of the action plans, needs and results.

#### b) Develop an outreach programme

There is still an ambitious plan to develop an outreach programme to all member countries of IPC, and interested Developing Countries, to expand the active membership in this Working Party. Before getting this fully started, there is a need for further updating of the Global Directory of Poplar and Willow Experts concerning this Working Party.

#### c) Develop a liaison with other Working Parties

The topic of developing a liaison with other Working Parties of IPC to determine areas of common interest was explored by both chair and technical secretary of the Working Party on Harvesting and Utilisation already in 2007. Anyhow it is expected that the inter-WP liaison will be an ongoing activity. In this respect, the new Working Party on Sustainable Livelihoods, Land-use, Products and Bioenergy Support is already an interaction between previously separate Working Parties on Harvesting and Utilisation of Poplar and Willow Wood and Production Systems. The earlier proposal/justification for a new Working Party on Socio-economic Issues of Poplar and Willow Development (sustainable land-use and livelihoods, climate change mitigation and adaptation and bioenergy/biofuel) has been integrated this way.

### **Foreword (Action plan 2020-2022)**

According to the guidelines, this Action Plan 2020-2022 is intended to prepare a programme of work and to detail this with achievable specific activities, assign persons responsible, detail indicative delivery dates and show linkage with FAO. Objectives are suggested to be SMART, which is Simple, Measurable, Achievable, Realistic and Time-bound.

### **Proposed Activities – Objectives (Action plan 2020-2022)**

Topics from the Report 2018-2020 are further integrated into the work foreseen for 2020 - 2022.

### Organizational structure

a) Networking

Based on all input received a renewed network for experts is becoming real for all different aspects of harvesting and utilisation, of wood processing and products of poplar/willow and other fast-growing species and production systems related. Furthermore, it is important to interact with existing industrial networks (e.g. Pro-Populus in Europe) as well as networks related to sustainable livelihoods. This information will be compiled over the next years.

In addition to the ‘traditional’ countries, extra effort is needed to involve ‘new countries’ that are currently part of the WP. This will i.a. be done by checking publications from research teams and verifying links to R&D responsible people in the industry besides discussing with national representatives in other WP’s.

b) Regional network managers

The WP Executive (chair, vice-chairs, and technical secretary) still needs to be redefined as a group of regional network managers for China, Asia, South America, North America, Africa, Europe. Both relevant experts relating to the whole forestry wood chain from production systems up to products and taking into account impact on livelihood need to be considered. To increase the networking potential each of the vice-chairs will be asked to appoint a co-worker/colleague having some more options to actively work on databases and data collection as well as communication in general.

c) Proposal for a European COST Action

To increase interaction on innovation in Europe we could envisage establishing a related COST Action. This could include aspects related to production, energy, biorefineries, but surely there is a need to focus on many aspects of the Green Deal and primarily also on Green Building, e.g. the potential for CLT and other engineered wood products.

Research and development

a) Organising meetings/workshops/conferences

Dedicated conferences as organised earlier like by the Working Party on Harvesting and Utilisation (Nanjing 2008, Léon 2016) will be organised focussing on technical aspects of producing poplar/willow wood products. This topic will also serve as further possibilities for liaison with other WP’s.

b) State of the art database

To make the WP more attractive for (young) researchers a state-of-the-art database is proposed dealing with publications related to harvesting, utilisation and product properties. This database should be subdivided or allow sorting by category of publication (e.g. peer reviewed, conference proceedings, etc.), date of publication and envisaged/studied poplar/willow product as key search parameters alongside a general keyword list.

c) Initiate new research, R&D

To examine the prospects and mechanisms of initiating new and needed international collaborative R&D project(s) to advance the work on production systems up to utilisation of Poplars and Willows, the updated network of experts will be used.

Furthermore, in this respect, it would be good to introduce specific work on biomass for energy as a key technical topic of the WP dealing primarily with processing parameters (evaluating different industrial biomass to energy conversion options) and the interaction with material processing, e.g. the production of wood-based panels.

### Membership

#### a) Support young scientists

There is a need to set up a support system for young scientists (Ph.D. and young postdocs), e.g. grants for short-term scientific missions (STSM), support for conference participation.

#### b) Compiling country-based information

A compilation of all the details on topics related to on Sustainable Livelihoods, Land-use, Products and Bioenergy should be made based on the input provided in the national reports that are an excellent starting point for this. Specific focus should be on other fast-growing species.

### Focus and outreach

#### a) Outreach, website

Similarly to the European organisation Pro-Populus (The European poplar association), we propose improving the website of the IPC Working Party on Sustainable Livelihoods, Land-use, Products and Bioenergy and hence underline the positive aspects of growing poplars in relation to a sustainable society. The new version of the website of Pro-Populus covers this topic:

#### b) Working party beyond poplar

As it is the intention to look beyond the past focus on Salicaceae (ie. poplar, aspen, willows, etc.) specific work is intended to broaden the scope to species with similarities either in respect to cultivation and impact on livelihoods or products and ecosystem services provided. Furthermore, it is of interest to enlarge the geographical scope from those species more linked to temperate regions towards fast-growing tropical hardwood species.

#### c) Branding

There is a proposal for rebranding the working party on the bioeconomy (wood, fiber, cellulose, carbon, energy) and trying to strengthen links with organizations like ITTO, the FAO Advisory Committee on Sustainable Forest Industries, the World Bank, and umbrella industry associations. This can be complemented with the idea to separate livelihoods and income as a cross-cutting working party and somehow simplify the working.

### SWOT Analysis

The below SWOT analysis remains valid in most of its topics and can still be used for guiding the WP initiatives.

<b>Strengths</b>	<b>Weaknesses</b>
<ol style="list-style-type: none"> <li>1) Partly based on the oldest working party related to key elements in sustainable poplar/willow forestry woodchain;</li> <li>2) Diversity of products for society development;</li> <li>3) Sound expertise/experience of Working Party members;</li> <li>4) Integrating production systems and products (either material or energy) involves key players for a sustainable approach of poplar plantations.</li> </ol>	<ol style="list-style-type: none"> <li>1) Important topics are covered by this working party but some could be difficult to integrate and might need a separate approach e.g. sustainable livelihoods;</li> <li>2) Very low input from WP members;</li> <li>3) The missing link to young scientists active in the field of wood technology by National committees;</li> <li>4) Insufficient international and national networking for this WP.</li> </ol>
<b>Opportunities</b>	<b>Threats</b>
<ol style="list-style-type: none"> <li>1) The growing interest in lignocellulosic biomass for both material (direct or indirect) and energy will create specific opportunities for fast-growing plantation trees like hybrid poplar;</li> <li>2) The industry is more aware of the need to network on an international, national and regional level;</li> <li>3) New innovative opportunities related to engineered wood products as well as biomass for energy and the overall interest in sustainable production- processing fast-growing trees;</li> <li>4) Besides plantation-grown hybrid poplars also the aspen resource and other species of the <i>Salicaceae</i> will be of higher interest in the future. Other tree species should be considered especially when relating similarly to sustainable livelihoods.</li> </ol>	<ol style="list-style-type: none"> <li>1) Lower interest, e.g. in Europe in promoting poplar/willow plantations could lead to critical issues on supply, demand, specifications and price of forest products;</li> <li>2) Biomass for energy should become an opportunity and not a threat for poplar cultivation, hence the need to interact with the agricultural sector;</li> <li>3) Low international investigation effort to improve the knowledge of wood properties &amp; potentialities;</li> <li>4) There seems to be a reduced need for developments and improvements of hybrid poplar products. It slowed down the industrial investments, starting with the reduction of the available budget for research.</li> </ol>



## **IV. WORKING PARTY ON ENVIRONMENTAL AND ECOSYSTEM SERVICES**

*Activity Report: July 2018- September 2020*

Sharon Doty, Chair

Andrej Pilipović, Co-Vice Chair

Lou Licht, Co-Vice Chair

Ron Zalesny, Secretary

### **Introduction**

We have had two major activities since our last IPC meeting:

- a) First, we worked with Elizabeth Rogers (USDA Forest Service) who designed our WP5 Science Briefs and finalized ten of them (see below) for inclusion on our WP5 webpage. Sciences briefs are two-page summaries of published manuscripts and major reports, activities, etc. related to Environmental and Ecosystem Services.
- b) Second, we conceptually redesigned our WP5 webpage and sent those suggested revisions to Ben Caldwell. We are hoping our WP5 webpage will be new during autumn 2020.

### **Other Activities**

We made further progress on the activities proposed by WP5 in Berlin for 2016- 2020:

- a) Hold WP5 meetings as satellite meetings to other relevant conferences
  - i) Ron Zalesny led a WP5 meeting at the Woody Crops International Conference held in July 2018 in Rhinelander, Wisconsin, USA.
  - ii) Andrej Pilipović led a WP5 meeting at the 15th International Phytotechnologies Conference held in October 2018 in Novi Sad, Serbia.
  - iii) Ron Zalesny led a WP5 meeting at the Seventh International Poplar Symposium held during October/November 2018 in Buenos Aires, Argentina.
  - iv) Andrej Pilipović, Ron Zalesny, and Lou Licht planned to hold a WP5 meeting at the 16th International Phytotechnologies Conference in September 2020, but the conference was postponed because of the COVID pandemic. Pilipović and Zalesny plan to hold a WP5 meeting when the conference takes place – hopefully in 2021.
  - v) Andrej Pilipović plans to hold a WP5 meeting at the Eighth International Poplar Symposium in 2022 in Novi Sad, Serbia.
- b) Create science briefs on “green technologies” for distribution via the IPC website to stakeholders
  - i) Sharon Doty teaches a course on “Environmental Applications of Plants: Bioremediation and Bioenergy” in which she assigned the making of Phyto info sheets. She has over fifty of these phyto info sheets from previous years of the course from which to select for posting on the website, two of which have already been converted to

Science Briefs. She has a hundred students enrolled in the course this autumn quarter and will again select the best ones for finalizing as Science Briefs (see below)

ii) The following Science Briefs were finalized (Elizabeth Rogers, Technical Editor):

- Zalesny, R.S. Jr., Stange, C.M., and Birr, B.A. 2019. Hybrid poplar and Russian olive: Height growth, survival, and phytoremediation on saline soils. (December 2019)
- Zalesny, R.S. Jr. and Bauer, E.O. 2019. Selection of poplars and willows for phytoremediation of nitrate. (December 2019)
- Pilipović, A., Zalesny, R.S. Jr., Orlović, S., Drekić, M., Pekeč, S., Katanić, M., and Poljaković-Pajnik, L. 2019. Poplars grown on artificially contaminated soils: growth and physiology. (October 2019)
- Zalesny, R.S. Jr., Headlee, W.L., Gopalakrishnan, G., Bauer, E.O., Hall, R.B., Hazel, D.W., Isebrands, J.G., Licht, L.A., Negri, M.C., Guthrie Nichols, E., Rockwood, D.L., and Wiese, A.H. 2019. Long-term phytoremediation using poplar: ecosystem services. (June 2019)
- Zalesny, J.A., Zalesny, R.S. Jr., Wiese, A.H., and Hall, R.B. 2007. Selecting poplar trees to remediate landfill leachate. (June 2019)
- Zalesny, R.S. Jr., Berndes, G., Dimitriou, I., Fritsche, U., Miller, C., Eisenbies, M., Ghezehei, S., Hazel, D., Headlee, W.L., Mola-Yudego, B., Negri, M.C., Guthrie-Nichols, E., Quinn, J., Shifflett, S.D., Therasme, O., Volk, T.A., and Zumpf, C.R. 2019. Positive water linkages of bioenergy and phytotechnologies: poplars and willows. (April 2019)
- Zalesny, R.S. Jr., and Bauer, E.O. 2007. Bridging the gap between phytoremediation, agronomy, horticulture, and forestry. (April 2019)
- Rogers, E.R., Zalesny, R.S. Jr., Hallett, R.A., Headlee, W.L., and Wiese, A.H. 2019. Root-shoot allocations of trees grown for phytoremediation. (March-2019)
- Drugge, J., and Doty, S. 2019. Riparian buffers in agricultural areas. (March 2019)
- Stavney, L. 2019. Phytoremediation in your neighborhood: A guide for high school students. (March 2019)

c) Increase use of the IPC Newsletter to disseminate reports on the “Environmental and Ecosystem Services” research

i) We included reports in the 2016 to 2018 issues

- 2016 issue: “Key roles of the poplar microbiome”- Sharon Doty
- 2018 issue: “Successful field trial of endophyte-assisted poplar tree phytoremediation of TCE”- Sharon Doty
- 2018 issue: “Experiences of application of willows for environmental services” – Written by Teresa Cerrillo (genetic resources group)

ii) We have not seen additional IPC newsletters since 2018. If this is still a forum in which we can disseminate information on the environmental applications of poplars and other fast-growing trees, we are happy to do so.

## V. WORKING PARTY ON POLICY, COMMUNICATION AND OUTREACH

*Activity Report: July 2018- September 2020*

Barb Thomas (Canada), Chair

Raju Soolanayakanahally (Canada), Vice-Chair

### **The programme of action for 2016-2020 included:**

- a) Attract membership of interested parties;
- b) Establish links to other working parties;
- c) Establish a web portal on the IPC website.

### **Mandate:**

- a) to facilitate the transfer of knowledge and technology particularly from researchers (scientists and academics to practitioners, policymakers, donors, the public).
- b) provide outreach for working parties 1-5.
- c) support National Poplar Commissions and provide wider support to the IPC membership.
- d) Provide links to existing policy documents broken down by Region – Country (members and non-members) – State/Province/etc;
- e) Provide a repository of current policy barriers to providing direction on research needs for different regions of the world; and
- f) Provide ‘News Flashes’ to all IPC members and National Commissions when new information is loaded to the IPC website (relating to all working parties);
- g) Develop a template for ‘Highlight Sheets’ - a 2-page fact sheet with take-home messages from science outcomes.
- h) Worked with the IPC Secretariat on the new infographic
- i) Worked with IPC Secretariat & Chair on an early review of new IPC implementation strategy
- j) Unable to recruit new members

### **Mandate – proposed for 2021-2024**

- a) NEW: Support the IPC Secretariat
- b) Request that each WP develop 2 Highlight Sheets for practitioners – template to be provided and the final product developed jointly with WP6

- c) Determine if support can be provided to the existing Newsletter produced by the Argentinian NPC
- d) Assist with dissemination of new IPC vision and mandate and work to develop new memberships

#### **Next steps – new opportunities**

- a) I believe there is considerable opportunity for WP6 to find its niche with the new mandate of the IPC. This is highlighted in the consultant report as follows:
  - The IPC could be an *efficient and effective network for the transfer of science-based knowledge to implementation in the field* by fostering the sustainable management of fast-growing trees in rural, urban, and peri-urban landscapes worldwide. The IPC can become a technical leader and facilitator of knowledge transfer on poplars and willows in temperate zones, and eventually expand into work in new geographies.
- b) Strategic Goal #3 – Outreach and communication.
  - Disseminator of information on the role of fast-growing tree species in sustainable development by pro-actively bringing relevant information to the attention of key development processes or stakeholder groups, beyond academia.