



Poplar and Willow News

*Newsletter of the International Poplar Commission
"Poplar and Willow News"*

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Editorial

Dear Readers,

Welcome to the newsletter of the International Poplar Commission (IPC). Below you will find information on international conferences hosted by the national poplar commissions of the different member countries, as well as other events of interest related to the production of and research in poplar and willow.

This space also informs and reviews the main activities of the IPC and other organizations in order to circulate useful information that may be of interest to the whole community of the Salicaceae.

This newsletter also includes a section on publications that presents papers, abstracts, books, and new research, among other things. We invite you to participate by submitting your articles, papers, research reports, interviews, etc.

Kindly send to salicaceas@gmail.com

The editorial committee

Past events

Poplar and Willow Council of Canada 2017

Jim Richardson
Technical Director, Poplar and
Willow Council of Canada

The city of Edmonton, capital city of the Canadian Province of Alberta, hosted the June 2017 gathering of the Poplar and Willow Council of Canada (PWCC). As it has done on many occasions over its 40-year history, the Council chose to meet in conjunction with a larger event of interest to PWCC members. In this case it was the 11th North American Forest Ecology Workshop, a biennial conference of forest ecologists, scientists, forest land managers and academics from Canada, the United States and Mexico. More than 200 people gathered at the University of Alberta for three days of technical presentations and a full day of field visits on the theme of Sustaining Forests: From Restoration to Conservation. There were a total of 170 oral presentations and 31 posters offered in plenary sessions, special sessions of invited papers and concurrent sessions of contributed voluntary papers and posters. Many of these concerned the ecology and management of *Populus* species. Key topics included forest restoration and reclamation after natural or human-created disturbance, adapting forest management to climate change, and the ecological risks and benefits of assisted migration. The conference organizers plan to publish some of the papers in the peer-reviewed journal *Forest*



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Barb Thomas, IPC Executive Committee member and past Chair PWCC, addressing participants at the 11th North American Forest Ecology Workshop. Photo courtesy Raju Soolanayakanahally



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Poplar genetics and management field trip participants in hybrid poplar research trial at Alberta-Pacific Forest Industries ('Odile' clone in centre). Photo courtesy Raju Soolanayakanahally

Ecology and Management. Meanwhile, abstracts of all presentations can be viewed online at <http://nafew.org/2017-agenda/>.

The conference offered a choice of five field trips. Given that Edmonton lies on the edge of the aspen parkland zone of the Canadian prairies, it is not surprising that four of those tours focused on *Populus* species, including trembling aspen (*Populus tremuloides*). One tour, led by Barb Thomas (University of Alberta), past chair of PWCC and a member of the IPC Executive Committee, featured poplar genetics and management on the Forest Management Agreement area of Alberta-Pacific Forest Industries Inc. (AI-Pac) about 200 km north of Edmonton. AI-Pac's tree improvement programme, which has acquired and developed more than 25 000 new genotypes since its initiation in 1993, is based on selecting fast-growing, high-quality fibre trees adapted to the harsh local climate and resistant to *Septoria* canker. Over 10 000 ha of

operational private land plantations of hybrid poplar have been established. Although new plantations are not currently being planned, the extensive experimental material is being maintained.

PWCC held its annual business meeting during the conference to receive administrative, financial and technical reports, review progress, and elect board members for the coming year. An updated, revised online directory of poplar and willow clones will soon become available to members on the PWCC website (www.poplar.ca). Raju Soolanayakanahally remains Chair of the Council, and Martin Labelle was welcomed to the Board of Directors as Chair of the Environmental Working Group. The 2018 meeting of PWCC will be held in Rhinelander, Wisconsin, in the United States of America in late July in conjunction with the Short Rotation Woody Crops Operating Working Group of the USA.

Meeting of the National Poplar Commissions of Argentina and Chile

In the framework of the organization of the Salicaceae Symposium 2017, and of the Fifth International Congress of Salicaceae, Ms Lucrecia Santinoni subsecretary of Industrial Forestry Development of Argentina travelled to Chile together with Mr Esteban Borodowski, Chair of the National Poplar Commission Argentina (NPC).

At the Ministry of Agriculture of Chile, Ms Santinoni and Mr Borodowski met the subsecretary of Agriculture, Claudio Ternicier González, and the Manager of Development and Forestry Promotion of the National Forestry Corporation (CONAF), Manuel Rodríguez Meneses.

During their visit, Lucrecia Santinoni and Esteban Borodowski also had a working meeting with representatives of NPC Chile to discuss common



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Representatives of NPC Argentina and NPC Chile

strategies to adopt during the conference to support developing poplars and willows in their respective forest policies.

Fifth International Congress of Salicaceae

The 5th International Congress of the Salicaceae took place from 13 to 17 November in Talca, Chile. It was a large-scale technical meeting with presentations and discussions from selected speakers. Promotion of poplar and willow plantings was prompted through discussions and Technical Trips.

Pre-congress seminars were held on Monday 13 November. The conferences and poster sessions were held on Tuesday 14 and on Wednesday 15 November. On Thursday 16 and Friday 17 November, there were two field trips.

For more information about the Salicaceae Symposium 2017, please visit the Jornadas de Salicaceas website: <https://jornadasdesalicaceas2017.blogspot.com.ar/>

Source: Organising Commission of the Salicaceae Symposium 2017



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Poplar plantations visited by participants to the Jornadas de Salicáceas 2017

Articles of Interest

Successful Field Trial of Endophyte-Assisted Poplar Tree Phytoremediation of TCE

Prof. Sharon L. Doty, University of Washington

In new research published in *Environmental Science and Technology* (1), a natural bacterial strain capable of rapidly degrading the common, carcinogenic pollutant, trichloroethylene (TCE) strongly improved phytoremediation. While poplar trees have been used successfully for phytoremediation of TCE (2), sometimes the use of the trees is hampered by the phytotoxic effects of the pollutant and is perceived as being too slow by regulatory agencies. By partnering the poplar with a native endophyte, a beneficial microbe living within plants, the technologies of phytoremediation and bioremediation were synergistically improved. Poplars have extensive root systems, stabilizing the soils while accessing the polluted groundwater. The bacteria within the poplar, without needing to compete with soil bacteria, could rapidly degrade the pollutant taken up by the plant. The technology was easily deployable since the bacterial strain is easy to grow, and hardwood cuttings can simply be soaked in a dilute solution prior to planting. The endophyte-inoculated trees were visually healthier and grew larger. There was evidence of increased TCE degradation, with significantly reduced TCE concentrations in the tree cores and 50% more of the TCE metabolite from the inoculated trees.

Using endophytes to improve phytoremediation has advantages over other approaches. Ten



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Participants in the field trip organized during the Jornadas de Salicáceas 2017

years ago, we published on the development of transgenic poplar trees with enhanced removal of TCE and other carcinogenic pollutants (3). While the research was a success, the trees were not used by companies, likely due to the regulatory hurdles surrounding transgenics, especially GMO trees (4). In contrast, this endophyte-assisted phytoremediation technology utilized a natural member of the poplar microbiome so its use is not restricted. Another advantage of the technology is its flexibility. Dr. Jud Isebrands, consultant on the field test project and co-author of the research article, had selected three poplar clones that could be suitable for this SuperFund research site in California. Since the endophyte can be used on any plant species (5), the technology could be readily tested on multiple varieties.

With the help of this plant-microbe partnership, we hope to see a greater use of phytoremediation. There are thousands of TCE-contaminated sites around the world that are only monitored due to the high cost of engineering-based remediation technologies. It is our responsibility to future generations to remove these carcinogens from the environment, and leave a greener legacy.

The University of Washington press release about our research article can be found here: <http://www.washington.edu/news/2017/08/14/probiotics-help-poplar-trees-clean-up-toxins-in-superfund-sites/>

The endophyte strains for TCE degradation (6), and for PAH degradation (7,8) have been licensed to Intrinsyx Research Corporation. Contact Dr. John Freeman for more information (jfreeman@intrinsyx.com). This research was supported by the U.S. National Institutes of Health through a Small Business Innovation Research grant to Dr. Michael J. Blaylock of Edenspace Systems Corporation. Support for Doty's research was also provided by the Byron and Alice Lockwood Foundation.

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Hybrid between *Populus ciliata* and *P. deltoides* for warm locations

R.C. Dhiman and J.N. Gandhi
and P. K. Pande*

Wimco Seedlings Unit (ITC-PSPD),
*FRI Dehradun
dhimanramesh@yahoo.com

Populus deltoides is the main commercially grown *Populus* species in India. Its culture is based on around two dozen cultivars mainly grown in Indo-gangetic plains towards south of the Himalayan foothills in the north western region of the country.

None of the indigenous or introduced *Populus* species had ever existed before introduction of *P. deltoides* in the present region of intensive poplar culture approximately four decades back. *P. deltoides* in its natural distribution occurs between 28-46 °N latitudes and can tolerate warm temperature up to around 45 °C and hence the species was preferred for trial in these locations.

P. ciliata- the Himalayan poplar is widely distributed *Populus* species in the Indian temperate region. It is found over 2500 km between 1300 to 3500 m a.m.s.l. and between 27-33 °N latitudes in the Indian Himalayas. It does not grow in warm locations of low altitudes and latitudes and all attempts till date to grow in plains have failed. The tree in such locations becomes bushy with modified morphology of small and narrow leaves and invariably die due to high temperature. There have been repeated attempts to develop hybrids between *P. ciliata* and other compatible species and some of them have been successful for their culturing in temperate and sub-temperate regions. We in Wimco Seedlings have been working on this project since long and have developed a few thousands hybrid seedlings involving both male and female parents of *P. ciliata* and other *Populus* species during the last two decades. Table-I. gives details of the crosses made between *P. ciliata* and *P. deltoides* during the year 2009. Crosses with female *P. ciliata* parents are easily made, however they fail to survive in warm locations. Crosses with male *P. deltoides* parents gave limited success. Hybrid seedlings were screened for three consecutive years in the nursery and one of the selected genotype was field planted which has shown adaptability and comparable growth in the warm and low altitudes locations.

The hybrid along with parents were evaluated for their leaf and some other traits (Table-II). This hybrid acquired adaptability trait of *P. deltoides* which has been commercially grown in these warm locations for a few decades now.

Wood anatomical studies viz., Fibre length (FL), FD=Fibre diameter (FD), Fibre lumen diameter (FLD), Wall thickness (WT), Vessel element length (VL), Vessel element diameter (VD) and Specific gravity (SG) of the hybrid along with its two parents were carried out by the third author at the Forest Research Institute Dehradun (Table-III). The mean values of these traits are in-between for hybrid, maximum in *P. deltoides* and minimum in *P. ciliata* indicating that the wood quality of the hybrid lies between its two parents.

The selected individual was planted in non agriculture land and was observed for its growth at our R&D centre Bagwala located at 28 °N latitude and 200 m a.m.s.l. where summer temperature sometimes touches 45 °C. Its growth is comparable with S7C8 cultivar under similar site conditions (Fig.-II). In five years, the hybrid has grown to 19 m in height and 22.2 cm in DBH compared to that of S7C8 cultivar which has grown to 21 m in height and 22.1 cm in DBH under similar conditions.

This is the first report of development of a hybrid *P. ciliata* X *P. deltoides* that could be successfully grown in warm locations of low latitudes and altitudes. It is a significant step towards indigenization of poplar culture with genes of native species. This clone has yet not entered reproductive phase. Once it starts flowering, it would be used to make back crosses with either of the parents or other suitable species for further incorporation of indigenous genes and making more productive and adaptive genotypes to warm locations with low latitudes and altitudes.

Table-I. Manipulated crosses made with *P. ciliata* and other species during 2009

Parent		No. of crosses		Seedlings produced (No.)	Seedlings (No.) retained in nursery after			Final selection (No.)
Female	Male	attempted	successful		1 st screening	2 nd screening	3 rd screening	
P.t.	P.c.	3	1	96	35	0	0	0
P.d.(WSL39)	P.c.	6	1	10	8	0	0	0
P.d.(S7C8)	P.c.	6	3	240	194	7	7	1
P.d.(W62)	P.c.	2	1	15	10	0	0	0
P.d.(W110)	p.C.	3	2	38	21	1	1	0
P.c.	P.d.(G3)	3	3	12	8	0	0	0

P.c.=*P. ciliata*; P.d.=*P. deltoides*; and P.t.=*P. trichocarpa*. Names inside brackets are cultivar names

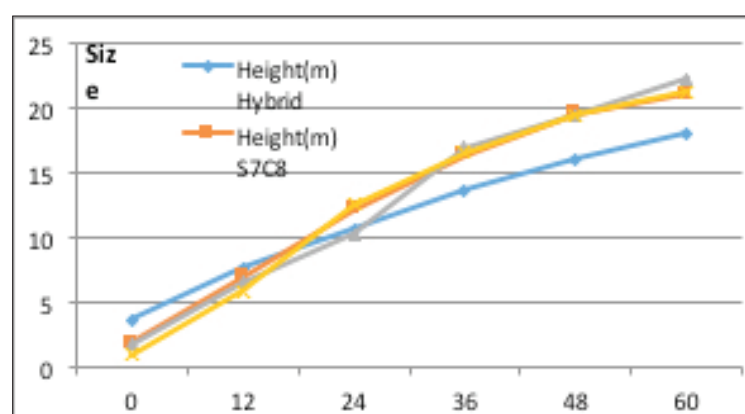
Table-II. Main traits of parents (*P. ciliata* and *P. deltooides*) and hybrid

Parameters	<i>P. ciliata</i>	<i>P. deltooides</i>	Hybrid
Length of Leaf blade (cm)	22.30	20.30	24.10
Width of Leaf blade (cm)	15.50	19.90	20.20
Ratio of leaf blade length: width	1.44	1.02	1.19
Length of Petiole (cm)	5.60	12.50	11.00
Ratio of leaf blade: petiole	3.98	1.62	2.19
Width of Petiole (cm)	0.55	0.62	0.51
Angle between midrib & 2nd vein	71.6	64.0	61.0
No. of Leaf glands	4.0	2.0	2.0
Length of apical Bud (cm)	0.72	1.00	0.68
Thickness of apical Bud (cm)	0.42	0.56	0.48
Shape of base of leaf blade	Wedge shaped convex	Cordate	Distinctly cordate
Shape of sinus at junction of leaf blade with petiole	Deep	Mostly wedge shaped	Mostly wedge shaped
Shape of tip of leaf blade	Very long pointed	Narrow acuminate	Long pointed
Pubescence on lower side of leaf blade	On leaf blade, mid rib, veins	Nil	On mid rib and veins
Undulation of edges of leaf blade	Minor	Major	In-between
Pilosity of petiole	Upper side completely pubescent	Nil	Nil
Color of upper side of leaf blade at flushing	Red	Green	Red
Color of the dorsal side of leaf blade	White	Green	In-between
Shape of petiole	Almost round	Almost flat	In-between
Color of the base of mid rib (Ventral side)	Red	Green	Red

Table-III. Wood anatomical traits (μm) of hybrid and its two parents

Species/Trait	FL	FD	FLD	WT	VL	VD	SG
<i>P. ciliata</i>	909	18.61	13.61	2.50	371.7	83.42	0.38
<i>P. deltooides</i>	1305.07	21.29	16.02	2.63	537.96	99.39	0.42
Hybrid	1083	18.70	13.69	2.51	476.4	89.56	0.38

Fig-I. Left top (A): Ventral view of leaves of *P. ciliata*, *P. deltooides* and Hybrid; Left bottom (B): Dorsal view of leaves of *P. ciliata*, *P. deltooides* and Hybrid; Right: Five year old hybrid tree.

**Fig.-II.** Comparison of growth (Height and DBH) of hybrid and S7C8 cultivar

Greater availability of improved willow clones in Argentina: towards a reconversion of plantations in search of a critical mass of quality for the industry and the potential for environmental applications

Teresa CERRILLO

National Institute of Agricultural Technology (INTA) - Responsible for the Willow Genetic Improvement Programme - Chairman of the Domestication Genetic Resource Conservation Group of the International Poplar Commission (IPC)

In the last decade there has been a worldwide increase in the economic importance of willows (*Salix* spp) due to their use in dendro-energetic plantations. Argentina, with approximately 68,862 hectares (Borodowski et al., 2014) is the second country in willow plantation (after China) and the first to produce roundwood (FAO, 2016). These forestations are concentrated mainly in the Delta of the Paraná River, one of the most important wetland macrosystems in America, with 1.75 million ha. Approximately 280,000 hectares of its surface correspond to low floodable areas apt for willow cultivation and with any other extensive productive alternative. The diffusion of the crop is mainly due to the ecological conditions of the territory, which are very favorable for the rapid growth of these mesophytic species that demand high soil moisture. One of the comparative advantages of the Paraná River Delta with regard to other territories is its proximity to the main industrial and consumer centers of the country. In addition to this productive nucleus of *Salix* spp., there are other regions with good potential for the genus, as is the case with Patagonia.

In terms of the purposes of the production, in Argentina more than 90% of the wood produced by willow forestation now supplies the paper and particle board industries and, to a lesser extent, sawmilling and unrolling.

Within the framework of the National Forestry Project, INTA develops a willow genetic improvement program, particularly focused on the Paraná River

Delta, which seeks to obtain adapted cultivars and superior productive traits to increase the quality of plantations, both in terms of volume of wood and in wood fitness. Progressively, an integrated and dynamic approach has been consolidated between INTA's Agricultural Experimental Station (EEA) in Delta, and the private sector. This has been materialized through agreements with the two main wood-consuming companies of that genus in the region and the articulated work with local producers at different scales. Having a more qualified availability of superior genetic material will allow the growth of industries and the development of new activities (Braier and Olemberg, 2014). The base phytotechnical study started more than two decades ago, on an improvement population of more than 20,000 individuals with genetic diversity for selection. This population was achieved by hybridizations, using introduced parents from international collaborating institutions.

Since 2005, INTA has established a wide network of trials in different environments of the Paraná Delta, where the materials are tested through statistical designs according to the site and the level of selection of the genetic material, at similar spacings to those used in productive systems (4m x 4m or 3.5m x 2.5m); including more recently lower densities in 5m x 5m plantation frames. The evaluations are based on different criteria: growth (total height and DBH), adaptation, tree shape, vulnerability to diseases and damage caused by pests. Complementarily, studies are carried out on wood characteristics at different ages, including industrial paper pulp testing and sawing process response.

The work is generating since 2013 the release of new cultivars (Cerrillo et al, 2017a), denominated: 'Lezama INTA-CIEF' (*S. matsudana* x *S. nigra*), 'Gemini INTA-CIEF' (*S. matsudana* x?), (*S. matsudana* x *S. alba*) and 'Yaguareté INTA-CIEF' (*S. alba* x?), 'Agonal INTA-CIEF' (*S. matsudana* x *S. alba*) and 'Ibicuy INTA-CIEF' (*S. nigra* x?). In April 2017 the most recent was registered: 'Carapachay INTA-CIEF' (*S. matsudana* x *S. alba*). All of them show productive advantages over traditional willows. Considering all the selection criteria in full, the first five stand out because of their "double purpose" nature of being simultaneously sawing apt and papermaking apt, which represent a technological innovation due to the absence of any other previous clonal material with that condition.



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In addition to the increased forest performance of the improved materials, these are clear substitutes for the 'Soveny Americano' clone, which currently occupies more than 70% of adult plantations (due to its high quality for newspaper and high tolerance to prolonged waterlogging periods, but characterized by low forest yield). In four performance trials of 8-year-old individuals, located at various sites in the Delta, the three clones which showed highest performance produced between 26 and 30 m³.ha⁻¹.year⁻¹, while the mean of the seven clones selected was 22.5 m³.ha⁻¹.year⁻¹. This mean is 45% higher than the average yield of three traditional clones which have been in production for decades, and shows the potential to almost double in the same period to the clone 'Soveny Americano'. The selected genotypes have different degrees of flood tolerance, so specific clones may be recommended depending on the flood risk of each area.

The adoption of the new technology has already begun, both in the operational plantations of large companies, and in those of small and medium producers, where a gradual restructuring is taking place replacing the traditional clones with the improved ones.

Moreover, through other local experimental networks, the genetic material obtained by the program is tested in other regions of the country,

such as in Patagonia (Thomas et al., 2017) and in Cuenca del Salado (Cerrillo et al., 2017b), having already some guidelines to establish new plantations. In addition, field experiments are driven to explore the potential of these willows in Silvopastoral systems, with highly satisfactory responses at an early age of the trials (Casaubón et al, 2017).

Experiences of application of willows for environmental services

Besides determining the capacity for wood production, INTA's technical teams aim to demonstrate the potential of these new willows for environmental applications.

Most of the species of the *Salix* genus have the peculiarities of pionerism and rusticity, which give them the hability to grow quickly and in short and efficient cycles (Paiero, 2014) to be used in effluent reuse processes, phytoremediation and restoration of sites affected by some disturbance.

• Reuse of treated urban effluents

The reuse of treated urban wastewater for forestation irrigation is a valuable tool for preserving environmental quality. As in other regions of the world, the wastewater treatment system through stabilization lagoons is widely used in several provinces in Argentina. In order to compare different plant materials to reuse treated effluent by irrigation, INTA from "Alto Valle de Río Negro" in conjunction with INTA Delta and a private local company, performed a trial in Rincón de los Sauces, Neuquén, Argentina (37°24'25 ' 'S, 68°54'35"W), in which two clones of Willows (' Los Arroyos INTA 'and one experimental: *Salix matsudana* x *S. alba*' 94.13.06 '), a poplar genotype (*Populus* x *canescens*) and *Eleagnus angustifolia* were tested. The plantation was fitted to a randomized



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complete block design (ten plants/plot and three replicates), with a spacing of 1.5 m x 0.5 m, and an initial density of 13,333 trees / ha. At the end of the first year, the two willow clones showed the best survival values (greater than 97%) and growth in height (greater than 3.5 m), followed by poplar (85%, 2.8 m) and *Eleagnus angustifolia* (57.5%, 1.9 m). The high yield of the willows at this early stage provides a promising perspective for short rotation (SRF) under irrigation with local urban wastewater, with the consequent double environmental contribution: a complementary treatment to improve the quality of the treated effluent and, second, the opportunity to obtain a forest product with increasing commercial demand (Tucat et al, 2016).

• Restoration of a quarry

Through an INTA "Alto Valle de Río Negro" project (Thomas et al, 2016) a collaborative experience with a local company was tackled to detect the possibility of restoration of a site degraded by quarrying (a form of open pit mining used to obtain building materials), which contributes to deforestation and soil degradation causing an impact on the environment. When the open pit exploitation was completed, a willow plantation was established at the site of the quarry, in Cervantes, Río Negro, Argentina (39°04'09 " S, 67°24'06"W). In a first stage, a surface of 0.26 ha, and at a density of 400 trees / ha (5m x 5m) was established with a view to a future silvopastoral approach. The clones 'Los Arroyos INTA-CIEF', 'Agronales INTA-CIEF' and 'Gemini INTA-CIEF' were tested and, after the first period of vegetative growth, they showed a survival percentage above 95.3% in all cases. Despite the early age of this plantation, the results already provide useful information about its rooting ability and survival under these site conditions.



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New project aiming at the use of poplar for producing lighter furniture and environmentally friendly packaging

Martin Weih

All-rounder poplar tree will make purchases lighter and more ecological!

Who can't relate to it, carrying heavy boxes after visiting a furniture store or the anger about tons of plastic and polystyrene after buying electrical devices? The EU-BBI-BIC-funded research project "Securing Sustainable Dendromass Production with Poplar Plantations in European Rural Areas", in short Dendromass4Europe, is focusing on the corresponding innovations for more eco-friendly

purchases that are safer on the back. Scientists and industrial partners from seven countries work together for the next five years. The project kick-off meeting with all partners took place on 7th and 8th June 2017 at the TU Dresden. An excursion on SRC (short rotation crops) and on poplar and forest tree breeding in Saxony was held on 9th June for the interested partners. Professor Norbert Weber of the Professorship of Forest Policy and Forest Resource Economics at Technische Universität Dresden coordinates the project:

"Within this large-scale project and together with our European partners in industry and research we want to achieve several things at the same time: to generate wood biomass from poplars in an environmentally friendly way and to use the biomass to produce innovative products. Of course such a project requires many colleagues from different disciplines joining to work together."

Dendromass4Europe (D4E) aims at establishing sustainable, Short-Rotation Coppice (SRC)-based regional cropping systems for agricultural dendromass on marginal land that feed into bio-based value chains and create additional job opportunities in rural areas. For that purpose, 2,500 ha of short rotation poplar plantations will be established on marginal or currently unused land in rural areas of the Slovak Republic. These plantations will provide the feedstock for the establishment of four new bio-based value chains based upon products from wood and bark from



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poplar trees: (1) functionally adapted lightweight board manufactured by IKEA Industries (Slovakia). The new structure gives more stability to the boards, which will be lighter and consuming fewer resources. Poplar bark, which currently serves primarily as a source for energy, is processed by Pulpack (Poland) into (2) eco-fungicidal moulded fibre parts. These fibre parts can replace plastics in packaging and can also be re-used without any problems. At the same time, Energochemica Trading (Slovakia) plans to incorporate the bark into (3) bark-enriched wood-plastic composite and (4) wood-plastic granulate.

The researchers of the National Council for Research (Italy), the Swedish University of Agricultural Sciences (Sweden) and Technische Universitaet Dresden support the industrial partners involved, with their expertise in the fields of agriculture, forestry and wood sciences. The Kompetenzzentrum Holz GmbH (Austria) and Daphne, Institute for Applied Ecology (Slovakia) are providing expertise on ecological questions of management. Stakeholders, especially the respective scientific and industrial communities, e.g. those of forest sciences, agricultural and forest policy, nature conservation and bio-based materials research will be informed and involved during the entire project for example via field demonstrations, publications and a project website as well as social media.

This project receives funding from the Bio Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 745874.

Contacts: Prof. Dr. Norbert Weber (project coordinator), norbert.weber@forst.tu-dresden.de; Prof. Dr. Martin Weih (representing IPC), martin.weih@slu.se

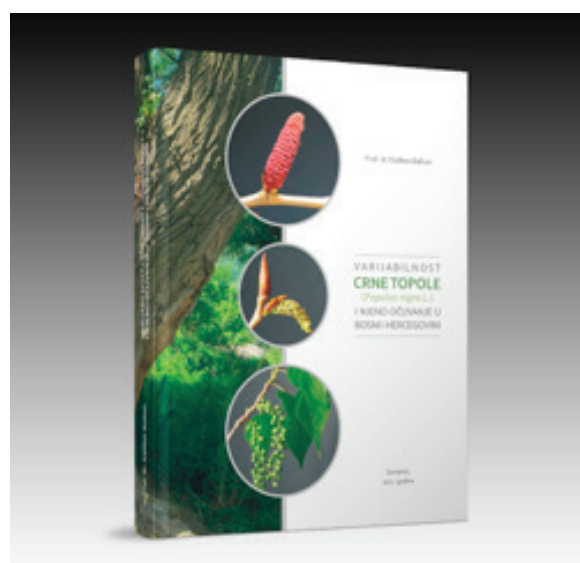
New Reference Work on Poplars and Willows

Variability of Black Poplar (*Populus nigra* L.) and its Conservation in Bosnia and Herzegovina

Dalibor Ballian

This year, the University of Sarajevo Faculty of Forestry as publisher, and Silva Slovenica with the publishing center of the Slovenian Forestry Institute in Ljubljana as co-publisher, published a scientific monograph of 205 pages. It includes 50 figures and 25 tables, and is written in Croatian with an English summary at the end.

The author provides a historical overview of the distribution range and use of the black poplar as one of the most significant forest tree species from an ecological and partly from an economic standpoint, though in Bosnia and Herzegovina, as in many countries of central Europe, it has been marginalized. The author writes that over time, the area of the black poplar's distribution was reduced under the impact of introgression and human activities, principally due to felling or indirectly because of the changes in ecological conditions on rivers caused by regulations. The author also lists activities that have been undertaken to preserve the black poplar, and considers the work done to research the inter- and intrapopulation variability on the morphological, phenological and molecular



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level, which should suggest the direction of further activities on the conservation of autochthonous genetic resources.

The book provides a detailed overview of the genus *Populus* characterized by great morphological variability, which can be surmised from the research of numerous authors. The chapters are complemented and supplemented with figures presenting various morphological characteristics of the black poplar. A separate description is provided of the hairy black poplar (*Populus nigra* ssp. *caudina*).

The author provides an overview of the natural distribution range of this species with images of the species' range, and describes the dynamic movements of the black poplar based on cpDNA information. The possibility of vegetative propagation, in combination with a high level of human interference with its expansion, undermines the scientific certainty in the expansion of various haplotypes in Europe, hence there is no clear picture of postglacial migration of the black poplar, as has been concluded by the majority of the listed authors.

A separate chapter provides an overview according to the ecological and vegetational array of forests in Bosnia and Herzegovina. Although for now poplars are not a commercial species, only those forest communities are listed which characterize forest districts, zones and regions associated with the pedology and climate factors that play a very significant role for poplars.

One chapter is dedicated to presenting the results of morphometric analyses of the identification of black poplars and their variability. In addition to inter- and intrapopulation variability of the black poplar, the results are also shown for a subspecies of the black poplar, i.e. hairy black poplar (*Populus nigra* ssp. *caudina*), characterized by very hairy shoots and leaves. Despite the fact that the preserved populations of the subspecies ssp. *caudina* are small and isolated, and are probably under the influence of genetic drift, the author concludes that measures should be taken to preserve its genetic resources. The monograph also presents the results of phenological observations in the clonal archive of black poplars, thereby presenting the phenological characteristics of the clonal material represented in it.

The research of ten microsatellite markers analyzed polymorphism in six river basins, from which adult trees of autochthonous black poplars were used for analysis. Based on the results obtained, the

author concludes there are differences between populations from different ecological niches, i.e. river basins, and the reason for this is also the strong anthropogenic influence through history, or else it was the climate differences among the habitats that have exerted the strongest influence on genetic differentiation between populations. Also shown are the results of importance for conserving forest genetic resources by the *in situ* method.

This monograph is a praiseworthy piece of work, the result of the author's years of research in the territory of Bosnia and Herzegovina. The monograph is richly illustrated with numerous images and tables, reflecting a large part of what has been described in the text. The monograph is intended for a narrow forestry scientific audience, but is written clearly and intelligibly, at the university and highly professional level, and will also be available for use not only by scientists and experts in natural and biotechnology field sciences, but also by students and a broad range of nature loving readers. It will be recommended as additional literature in forestry, especially in forest breeding and cultivation, and will contribute to the conservation of a significant forest species in the great abundance of the flora of Bosnia and Herzegovina.

The restoration or preservation of poplar populations represent an important contribution to the conservation of complex ecosystems such as flooded and riparian forests along the confluences of the rivers of Bosnia and Herzegovina. The monograph is an important contribution to the positive relationship of people and forest trees and popularizes an endangered species. It is also a reminder to pay more attention to such endangered species.

Prof. Davorin Kajba, PhD

News of the International Poplar Commissions

Re-organization of IPC Secretariat at FAO HQ

Dear IPC members,

As previously announced, Walter Kollert, former Secretary of the International Poplar Commission (IPC), retired at the end of March 2017. Walter, who served the IPC as Technical Secretary from late 2009 until his retirement, had succeeded Jim Carle in the position.

Walter joined UN FAO as a Forestry Officer, responsible for the Planted Forest Programme and IPC Secretary. His strong professional background included years of experience in forest management, natural and planted forests, afforestation, reforestation, forest rehabilitation, forest restoration, nurseries, forest economics, timber market, and forest products statistics. He developed this experience over years — mostly, working in East Asia and particularly in Laos and Malaysia where he was responsible for several projects funded by GIZ [*Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*].

Over the course of his career, Walter wrote or contributed to more than 130 publications. His professional contributions to the forestry sector, particularly to the planted forests programme and to the IPC, has been greatly appreciated, especially by the member countries that he served as a FAO Forestry Officer.

During his years of service with IPC, Walter organized four Executive Committee Sessions (Italy 2010, India 2012, Canada 2014 and Germany 2016) and two full Sessions (India in 2012 and Germany



Alberto Del Lungo

in 2016). He made a significant contribution to strengthening the IPC and to the reform process that will allow the Commission to expand its scope in order to support even more tree species and countries.

On behalf of the IPC Secretariat, I thank Walter for his professional experience, commitment and dedication. It is much appreciated. I would also like to take this opportunity to announce that until Walter's successor is appointed, Peter Csoka, Secretary of the Committee on Forestry, will act as Secretary A.I. while I will be in charge of the daily matters of the Secretariat. Until further notice, all queries related to the IPC can be sent to the inbox of the Secretariat (IPC-Secretariat@fao.org), copied to Peter Csoka (peter.csoka@fao.org) and Alberto Del Lungo (alberto.dellungo@fao.org).

Alberto Del Lungo,
IPC Secretariat



Peter Csoka



Walter Kollert and Shen Zhao, Chairman of the County Council; Siyang County, visiting poplar plantations in North West Italy.



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Walter Kollert closing the 25th Session of IPC in Berlin



©IPC/Del Lungo

Walter Kollert and the team of the IPC Secretariat at the 24th Session of IPC in Berlin (from left to right: Luca De Paoli, Michèle Millanes, Stefania Giusti, Alberto Del Lungo, Tiziana Tarricone and Walter Kollert).



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Walter Kollert and Jim Carle, the two last Secretaries of IPC at the 24th Session of IPC in Berlin

National Poplar Commission of Argentina

The President of the Argentinian National Poplar Commission, Mirta Larrieu, left her position for retirement on 1 June.

In her role as the President of the Commission, Mirta has done extensive work on poplar and willow cultivation endorsement in Argentina. She participated in international events such as in the sessions of the International Poplar Commission in India, China and Germany, where she coordinated

working groups and explained the situation of the Salicaceae in Argentina.

Esteban Borodowski assumes the role as the new Director of Forest Production as well as President of the Commission.

Since August 2007, Esteban has played a key role as Secretary of the National Poplar Commission of Argentina, as well as in the Organizing Commissions of the International Salicaceae Congresses in Argentina in 2006, 2009, 2011 and in 2014. He has been a member of the Executive Committee of the International Poplar Commission since 2012.



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Mirta Larrieu at the 23rd Session of the International Poplar Commission in China



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Mirta Larrieu at the 24th Session of the International Poplar Commission in India



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Esteban Borodowski and Mirta Larrieu



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John Balatinecz

It is with deepest sadness that we learned the passing of Professor John Balatinecz who died in Toronto, Canada, last August 6th.

John Balatinecz has been an active member and a strong supporter of the International Poplar Commission since 1980. He chaired for many years the Working Party on Harvesting and Utilization and was author of the chapter on 'Properties, Products and Utilization' in 'Poplars and Willows: Trees for Society and the Environment', the book published by FAO and CABI in 2014. The IPC brotherhood expresses its deepest condolences to his son, Ted, and to his extended family.

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Layout design: **Roberto Cenciarelli**, FAO

To subscribe, or to make inquiries, please
write to: salicaceas@gmail.com

FAO contact: Secretariat of the
International Poplar Commission,
email: IPC-Secretariat@fao.org

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