



# Poplar and Willow News

*Newsletter of the International Poplar Commission*

Issue N° 5, July 2015



## Dear readers,

Welcome to the 5<sup>th</sup> Newsletter of the International Poplar Commission (IPC) of the Food and Agriculture Organization (FAO) of the United Nations. The Newsletter reports on different issues concerning upcoming and past events, publications and articles of general interest related to poplars and willow cultivation. Purpose of the IPC Newsletter is to strengthen networking within poplar specialists through spreading information and reviewing main activities of the IPC and other organizations specialized on salicaceae. We appreciate the work of the colleagues that contributed to the newsletters by sending they articles or by notifying news concerning Salicaceas in the world. At the same time we cordially invite you all to continue sending articles of interest for the next edition to share your knowledge, experiences and reflections. Kindly send your contributions to: [salicaceas@gmail.com](mailto:salicaceas@gmail.com)

**The editorial committee**

## UPCOMING EVENTS

### XIV World Forestry Congress

7-11 September 2015, Durban, South Africa

Web site: [www.fao.org/about/meetings/world-forestry-congress](http://www.fao.org/about/meetings/world-forestry-congress)

Forests are essential to life on our planet, to mitigating and adapting to climate change, ensuring adequate supply of fresh water, enhancing biodiversity and providing sustainable incomes and livelihoods, including food security. But they face unprecedented and unrelenting pressures.

The 14th World Forestry Congress, hosted by the Republic of South Africa, will bring together the global forestry community to review and analyse the key issues and to share ways of addressing them.

The Congress – the first to be held in Africa - is inclusive of people from all countries, regions and sectors, whether they belong to a government organization, NGO, private company, scientific or professional body, a forestry society, or simply have a personal interest in attending. The broad participation and inclusive discussion on forestry issues will facilitate their mainstreaming in global agendas on sustainable development as well as building new partnerships.

Practical information:

The Congress welcomes the participation of people from all countries, regions and sectors, whether representatives of government or non-governmental organizations, private companies, academia scientific or professional bodies, forestry associations, local practitioners, or simply those who have a personal interest.

The Congress programme will be professionally and culturally rewarding, with a variety of sessions, events and dialogue, to ensure that all participants are engaged in defining a vision and strategies for the sustainable future of forests and forestry.

More details including registration, the programme, calls for papers and posters, etc., will be available at the main XIV Congress website that will be launched shortly.

**Contact:** [WFC-XIV-Info@fao.org](mailto:WFC-XIV-Info@fao.org)

## Biomass and Energy Crops V

Brussels (venue to be confirmed)

10 - 12 November 2015

President: Professor Bill Davies

FIRST ANNOUNCEMENT & CALL FOR PAPERS:  
DEADLINE 8 MAY 2015

### Call for papers

Identifying the most appropriate uses of biomass to ensure delivery of the greatest benefit is a key objective of current research. This requires evaluation of biomass and energy crops, conversion technologies, use of by-products and the development of integrated management systems. This research complements efforts to ensure biomass products remain competitive in a volatile market.

As attention increasingly shifts towards deployment of biomass in Europe, this conference provides a timely opportunity to exchange ideas and foster closer collaboration and mutual understanding to identify how we can most effectively use biomass as one means of reducing dependence on fossil fuels. The conference provides an ideal forum for stakeholders to meet and discuss future research.

The conference is being scheduled to coincide with the conclusion of two EU funded Framework 7 projects. Rokwood ([www.rokwood.eu](http://www.rokwood.eu)) is focused on the future policy framework, R&D projects and international co-operation for short rotation woody crops. LogistEC ([www.logistecproject.eu](http://www.logistecproject.eu)) aims to develop new or improved logistics and supply chain technologies. In addition, the conference is being co-sponsored by Supergen Bioenergy Hub ([www.supergen-bioenergy.net](http://www.supergen-bioenergy.net)) which aims to improve co-operation among stakeholders.

The key themes with associated topics will be:

### Production

Agronomy, crop selection, breeding, multifunctionality, land and water use, ecosystem services and impacts.

### Supply Chain and Logistics

Storage and drying, processing, development of equipment, transport, densification, temporal and spatial considerations.

### Conversion and Utilisation

Feedstock composition and quality, conversion plant performance and emissions, product diversification.

A final platform session will bring together aspects of the three sessions in order to explore whole system and lifecycle analyses, carbon balance, sustainability and economics.

Invited speakers include Tim Volk and Gustaf Melin.

Deadline for abstracts: 8 May 2015

Abstracts of papers can be submitted by mailing or faxing the attached sheet to the AAB Office, or online via our web site at [www.aab.org.uk](http://www.aab.org.uk). Click on CONFERENCES and then ABSTRACTS in the menu bar, then the title of Conference. Once you have registered as a user you can upload your details. Please indicate if your offer is for a poster or a platform presentation. Please ensure your POP UP BLOCKER is off, or the abstract may not load properly.

Presentations and posters from this Conference will be produced together in a volume of the Aspects of Applied Biology series. Copies will be available to delegates at the Conference.

Biomass and Energy Crops V conference offers

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## PAST EVENTS

### International Symposium on Forest Biotechnologies for Smallholders

Foz do Iguassu-Brazil

19-22 May


The global demand for forest products such as wood, paper, woodfuel, and non-wood forest products is rapidly increasing and is predicted for

some products to double by 2030. Planted forests will have to play a major role to meet this demand and to avoid the overexploitation and degradation of natural forests. Government agencies, private companies and smallholder estates have to be given due consideration for the development of programs and projects on planted forests. Estimates indicate that smallholders manage 32% of the 205 million hectares of planted forests for productive purposes in the world. The forestry component of agroforestry production systems that are owned by smallholder farmers contributes significantly to crop diversification, income generation, food security and environmental sustainability. The major obstacles smallholder farmers are facing in planted forest management are low technical knowledge and the lack of information on germplasm, reproductive material and propagation techniques. Instruments of forest biotechnology such as macro and micropropagation, application of molecular markers and genomics are increasingly used to support the establishment and management of forests, improving their productivity and tackle important challenges such as low productivity, pests, poor adaptation to adverse environmental and weather conditions.

for further information please refer to:

[www.fbs2015.com.br](http://www.fbs2015.com.br)

## General Assembly Pro-Populus 2015

On May 29, Pro-Populus had its general assembly. Pro-Populus, the "European poplar association" was founded in 2008 with the scope to put together, for the first time poplar stakeholders, representatives of the private sector: growers, promoters and industrial users of poplar (panels, packaging, energy, etc.). The establishment of Pro-Populus was supported by CEI-Bois, the European Confederation of Woodworking Industries, that is also the legal seat of the association. Pro-Populus is composed by 8 members representing associations of growers and industrial users of Belgium, France, Italy and Spain. More information regarding Pro-Populus can be found at website of the Association: [www.pro-populus.eu](http://www.pro-populus.eu) 

## ARTICLES OF INTEREST

### Rokwood: Fuelling dialogue between biomass research, industry, policy & business

By Kevin Lindegaard, Crops for Energy Limited & Gonzalo Esteban López, Agencia Provincial de la Energía de Granada

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Rokwood is a major project that is attempting to increase the market penetration of woody energy crops grown in short rotation plantations (SRPs) by identifying research requirements, proposing workable policy options and suggesting joint activities with European and international partners. The project is in its final year and this article will provide details of the outputs so far.

The project involves a large consortia – 20 partners from 6 countries (Germany, Ireland, Poland, Spain, Sweden and the UK as well as EUBIA

– the European Biomass Industries Association. Some of the clusters (Sweden and Germany) have a well-developed SRP sector whilst others (e.g. UK and Ireland) do not. Each country is represented by a triple helix of a small to medium enterprise (SME) a research body and a local authority. The SW of England partners are Crops for Energy, The Centre of Sustainable Energy and Dorset County Council. The project will end in November 2015.

#### Obstacles and barriers

Back in early 2013 we engaged in a major analysis of the SRP industry in the UK. Part of the exercise involved doing a PESTLE analysis. We held an interactive workshop involving a dozen or so SW stakeholders and identified 78 political, economic, social, technological, legal and environmental factors. Some of these were positive but there are

### What are short rotation plantations or SRPs.

They involve trees with single stems or grown as coppice with short growing cycles of 2-20 years. The project is mainly focussing on willow and poplar but there is also interest in exotics such as Robinia, Paulownia and Eucalyptus.

overwhelming number obstacles that are crippling the industry. Amongst these were the:

- Lack of incentives
- Lack of infrastructure
- Age of farmers
- Invisibility in Government departments
- Lack of awareness and understanding

We needed to condense this information down into a more manageable form. We used an old fashioned SWOT analysis to do this. The strengths, weaknesses, opportunities and threats listed here are some of the most important ones and were common to pretty much all of the clusters across Europe.

### Innovative measures to overcome the obstacles and barriers

The second part of the project involved the innovative measures required to overcome the problems that the industry faces.

### Research needs

We assessed the research needs of the SRP industry. Not surprisingly as this project is to a great extent driven by SMEs who are involved in the practical delivery of projects this centred on a lot of technical issues such as machinery improvement, woodfuel quality and environmental applications (such as water quality improvement and flood mitigation). Based on these needs we are developing some fully formed project ideas.

### Joint Action Plan

Rokwood partners spent months working on

developing a Joint Action Plan (JAP). This is one of the main outputs of the project and is in effect a route map on how to develop the SRP sector.

The JAP involves six priority areas and makes 34 recommendations for joint activities. Some of these will be started during the final months of the project whilst others will have a much longer timeframe.

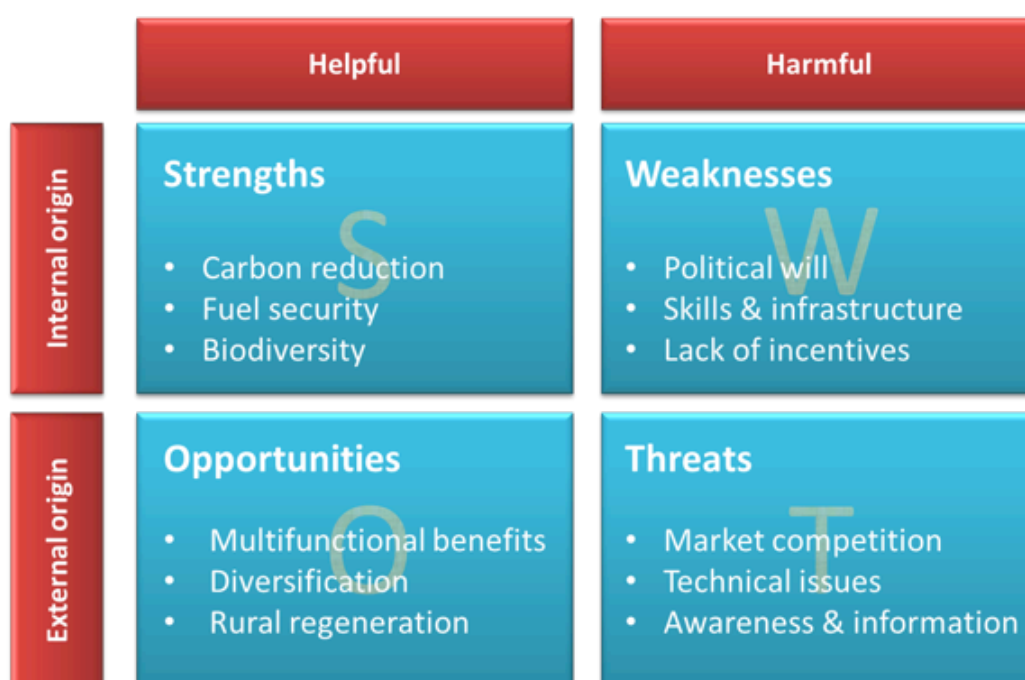
#### Rokwood JAP priority areas

- Development of SRP pilot/demonstration projects
- Engagement in lobbying at the EU-level
- Production of regional species & transnational agronomy guidelines
- Knowledge transference of cultivation, logistics and end-use
- Encourage multi-functionality and added value research
- Develop education and training programs for sector stakeholders

A public version of the JAP will shortly be uploaded onto the Rokwood website. The delivery of the JAP will indicate to the European Commission the sort of research and innovation projects that are required and it is hoped that it will therefore influence the future direction of R&D spending on SRPs.

### Policy briefs

Unfortunately, as a small industry, the SRP sector tends to be the recipient of poorly constructed policy mechanisms. This was recently in evidence with the watering down of the so called “greening measures” under the EU Common Agricultural Policy. At the drafting stage SRPs were seen as a key environmental component but lobbying by other





groups (representing food crops and conservation bodies) meant that the final regulations were unworkable. In future the SRP industry will need to be more organised and work together in order to compete against bigger lobbying sectors that always seem to get their way.

As a starting point each cluster developed their own policy briefs – a document setting out possible policy recommendations to deal with critical issues facing the SRP industry in their countries. The UK policy briefs focus on the need for:

- Evidence base review of SRC costs & benefits
- Enabling SRC harvesting, storage & processing infrastructure to supply local heat markets
- Lowering investment risk for SRC growers
- Matching supply and demand to help achieve economies of scale

These have been shared with Government departments and committees as well as regional stakeholders. All the policy briefs are available on the Rokwood website.

### **International Co-operation Strategy**

In tandem with the JAP we have produced an International Co-operation strategy (ICS). We've evaluated the offer and demand for SRPs from other European countries and major markets around the world including North America, South America and India. We've identified and contacted organisations and researchers with common interests and with whom we may take initiatives and projects forward. If you haven't been contacted but are interested in collaboration then you can join the Rokwood marketplace.

### **Implementing the JAP**

The final part of the project will involve the first steps to implement the JAP. The Rokwood website will continue to evolve and provide useful information such as Europe wide databases of machinery contractors and sellers of SRP plant material. We'll be producing a number of informative publications in the coming months – possibly the most influential of these will be the book of 40 best practice case studies. There will be the opportunity for Rokwood partners to go on staff exchanges and through the ICS we will be helping to provide some support to researchers who might be interested in learning or teaching counterparts in other countries. The project will conclude in November 2015 and the final meeting will take place alongside the Biomass and Energy Crops V conference in Brussels (see call for abstracts below).

*Rokwood: European regions fostering innovation or sustainable production and efficient use of woody biomass is supported by the European Commission under call FP7-Regions-2012-2103-1 "Regions of Knowledge" of the 7<sup>th</sup> Framework Programme for Research and Technological Development. General Coordinator: ttz Bremerhaven*

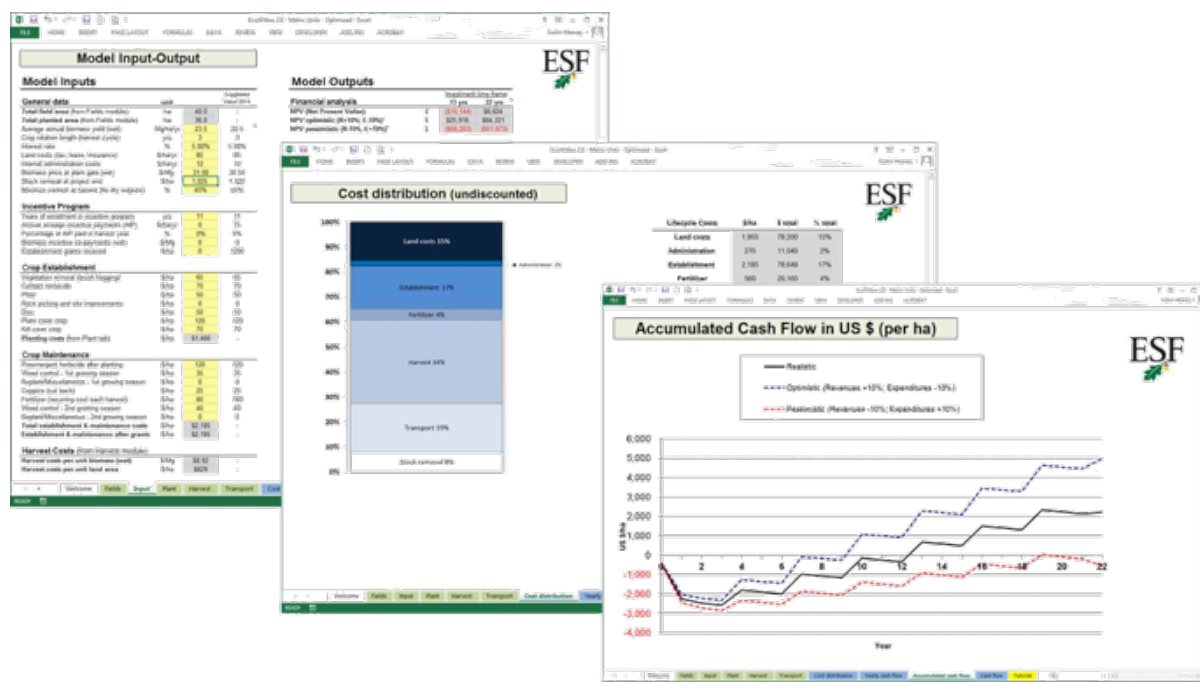
[www.rokwood.eu](http://www.rokwood.eu)

## **EcoWillow 2.0 – Updated Tool for Financial Analysis of Willow Biom**

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March 2015

EcoWillow is a financial analysis tool for willow bioenergy crops developed by the Willow Project Research Group at the State University of New York College of Environmental Science (SUNY-ESF). The tool was first released in 2008 and has been widely used since then, with downloads by over 1000 users in 70 countries around the world. The original model was based primarily on over 20 years of research and development of willow biomass crops at SUNY-ESF. A new version of this tool, EcoWillow 2.0, was released in October 2014. Version 2.0 has been comprehensively updated based on the latest research studies from trials across North America, data collected from commercial willow operations, and input from producers currently growing willow in New York State. The harvesting-module of EcoWillow has been updated based on the development and testing of a single-pass cut-and-chip harvesting system under development since 2008 in collaboration with New Holland Agriculture and other partners. A new module in EcoWillow 2.0 allows users to include multiple fields/locations and transport distances in one project analysis, and enables more precise calculations of headlands and planted areas. The new version also includes a more user-friendly design and other improvements based on feedback from various stakeholders in the willow industry. Four crop production scenarios have been developed using EcoWillow 2.0 to show the impact of key variables on costs and revenues,



Screenshots of various modules within EcoWillow 2.0 under the improved (hypothetical) crop production scenario that assumes achievement of several best practice targets throughout the production system.

and to demonstrate the potential for willow biomass crops to produce favorable returns on investment when best practice targets are employed and/or incentive programs are available.

EcoWillow will continue to be improved and updated as collaboration between producers, researchers and industry partners continues to spur innovation and advance the system. The latest versions of the model and supporting documentation can be downloaded at no-cost from the Willow Project website (go to [www.esf.edu/willow](http://www.esf.edu/willow) then follow the links for EcoWillow). Both English and metric unit versions of the model are available there, along with several fact sheets, an instructional video and contact information for follow-up inquiries. This work has been supported by the New York State Energy Research and Development Agency (NYSERDA), the United States Department of Energy (USDOE) and the US Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) through the Northeast Woody/Warm Season Biomass Consortium (NEWBio).

## New energy crops trial could be the finest in Europe

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Bio Global Industries Ltd based in Asheridge, Buckinghamshire is establishing one of the finest trials of perennial energy crops in Europe. The company is the UK distributor of the Austrian manufactured Biokompakt biomass boiler range and is aiming to showcase the many different fuels that the boiler can use. Plots of willow, poplar, eucalyptus, miscanthus and sida are being planted in the spring of 2015. BGI Managing Director Matthew Hunt says:

"We're sourcing elite energy crop material from UK, Sweden, Germany, Poland and Italy. Once mature our plantations will comprise one of the most comprehensive collections of perennial energy crops not only in the UK but the whole of Europe".

The Biokompakt boiler range is truly multi fuel. It can use around 30 different types of biomass and up

to three simultaneously. We want people to know all their options and to consider growing their own energy crops at all scales”.

“The periodic tariff degressions of the Government’s Renewable Heat Incentive will make some biomass installations less economic. However, our Biokompakt range will be less affected as its multifuel versatility means that end users can shop around for cheaper fuels or produce their own from the energy crop that suits their land and facilities” .

-Ends-

### Notes to Editors

1) BGI Ltd was set up in 2009 and is the UK exclusive distributor of the Biokompakt biomass boiler range. This product is different from other boilers on the market in that it can burn a wide range of alternative, high calorific and cost effective biomass fuels including energy crops and agricultural residues.

2) The Biokompakt range is manufactured in Austria and has an impressive 30 year track record of innovation and reliability. In 2008 Biokompakt was awarded the Innovation Award by the Board of Forestry and Forest Works in Germany.

3) Perennial energy crops include:

- Trees such as willow, poplar, eucalyptus
- Shrubs such as Sida (also known as Virginia fanpetals)
- Grasses such as Miscanthus (also known as elephant grass), switchgrass and bamboo.

4) The tree crops will be managed as short rotation coppice (SRC) and short rotation forestry (SRF) with harvest rotations of between 3-10 years. Sida and energy grasses will be harvested annually. All these crops can be burnt in the Biokompakt boiler range to produce renewable heat. Greenhouse gas savings are achieved because energy crop production and supply requires only a fraction of the energy inputs of fossil fuels. In addition, energy crops lock up or sequester carbon in the soil whilst they are growing.

5) The new plantations at BGI headquarters in Asheridge include: 30 Willow varieties produced from 4 different breeding programmes in the UK and Sweden.

- 8 poplar varieties produced in Germany and Italy
- 2 Eucalyptus strains of *E. glaucescens* originally sourced from Australia
- Sida hermaphrodita from Poland
- Miscanthus giganteus from the UK

The intention is also to plant reed canary grass, switchgrass and bamboo.

6) The Renewable Heat Incentive (RHI) aims to

increase the amount of renewable energy production in the UK by encouraging the installation of renewable energy technologies for heating buildings or for processing activities. The scheme pays rebates to participants with accredited installations. The popularity of both the non-domestic (~8200 biomass installations) and the domestic (~7000 biomass installations) schemes means that the tariff levels will be reduced (or degressed ) on the 1st April 2015 for new applicants. The non-domestic small biomass tariff will be degressed by 15% and the domestic RHI biomass tariff will be degressed by 20%.

7) It is possible to produce and process energy crops with a cost saving of between 65-80% compared to bought in woodfuels.

8) The UK Government’s Bioenergy Strategy was published in April 2012 and predicts that the greatest increase in domestic bioenergy supply will come from agricultural residues and energy crops.

## Poplar trees – unlimited source of advanced materials

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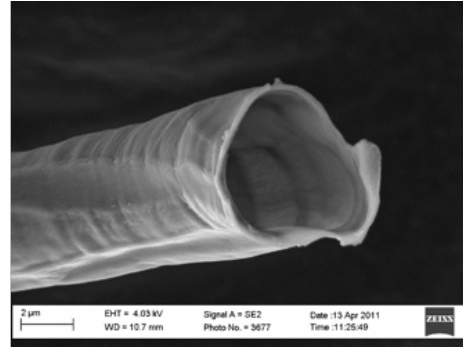
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*Populus* genus is one of the most spread tree in nature. Poplars belong to the Salicaceae family and can be found in 25–35 different subspecies, native to most of the Northern Hemisphere. Genetically improved clones of poplar trees are planted for production of wood to industry. They are also planted for protection against erosion and noise and used as natural water pumps. Poplar wood is used for pulp production in paper industry and for the production of transport packaging.

In urban areas poplars are not appreciated because



of their fibrous seeds appearing during blooming in early spring and which are floating around. Up to now seeds have been treated as annoying pollution, but latest developments reveal that **fibers are actually precious natural materials with unique morphological structure applicable in modern technology** as for example for production of natural super sorbents or smart medical materials.

On average one poplar tree produces 35 liters of fresh fruits which yield from 280.000 to 14.850.000 of seeds (0.9 kg) depending on species, location and type of the tree. More than 7.029.000 hectares of poplars are planted (on average 500 trees per hectare) around the world for wood production (FAO). This is a huge unexploited natural source of raw material for production of high tech material. As mentioned the fibrous poplar seeds are treated as waste or, in the best case, used as a cheap fertilizer. From the over 7 Mio Ha of poplar planted in the world over 3 Mio tons of high quality fibers can be produced. Such poplar seed fibers (PSF) presents an almost unlimited source of high quality fibers for the production of advanced materials and at the same time their use presents reduction of greenhouse gasses.

“Poplar trees unlimited source of Advanced Material (PAM)” project can ensure Europe as strategic producer of natural fibers for production of advanced materials. Production of hydrophobic fibers is cheap and clean and requires additional human resources for cultivation and harvesting, creating more job opportunities in agriculture.

The business opportunity is the establishment of

international production and merchandising network for poplar fibers to become industrial commodity and IME GmbH will take part in the production and merchandize of advanced materials.

Poplar fibers are extremely light, hydrophobic, possess large active specific surface area and float on water surfaces without long term degradation, even when soaked with hydrophobic liquids. Research showed that poplar seed fibers are a natural source for **production of different high tech fibrous materials as for example oil super sorbent, insulation material, ultra-light packaging, smart medical materials, drug delivery agents** and other products where hydrophobic fibers must be used.

The solid skeleton of hollow fibers consists of lignocellulosic material coated with hydrophobic waxy coating with active surface area of  $2.42 \pm 0.16 \text{ m}^2/\text{g}$  and can effectively replace extremely expensive hydrophobic nano cellulose fibers.

Fibers derived from the poplar seeds are, by their nature, hydrophobic/oleophilic micro tubes with  $8.74 \pm 5.75 \text{ μm}$  of outer diameter composed by 33-37 % of cellulose, 19-22 % of hemicelluloses (manly pentosans), 10-12 % of lignin and 1 -2 % of inorganic substances. Bulk density of the fibers is  $0.0036 \text{ g/cm}^3$  as 89 vol. % of the fiber is empty lumen that tends to be filled with hydrophobic/oleophilic substance when the fiber comes into contact with this substance. Hydrophobicity of the fibers is increased due to a coat of fiber surface with natural waxes. Fibers express improved resistance to gel blockage and higher mechanical resistance

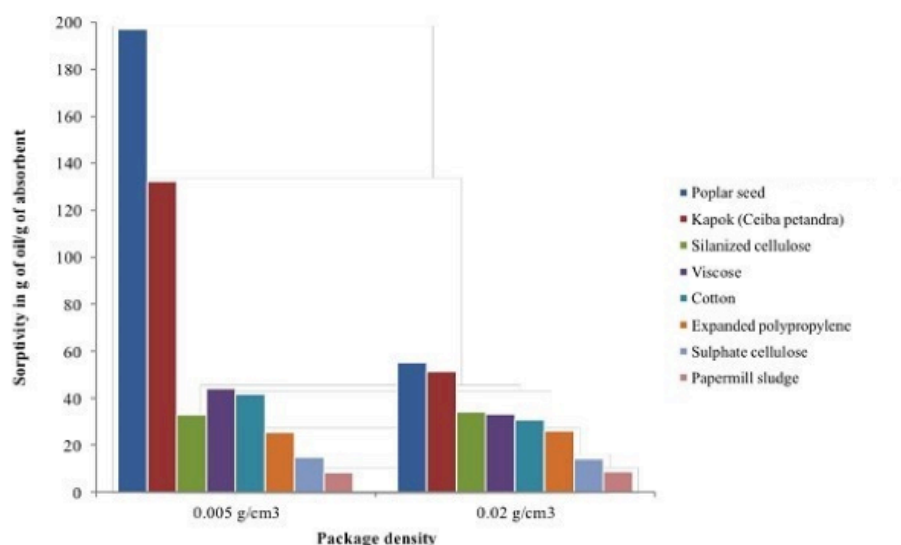


**Figure 1:** Poplar seeds absorb OIL



**Figure 2:** Seed fibres can be burned with zero residues and with zero emissions





Graph 1: The comparison of individual absorbents tested in accordance with ASTM F726-06 "Standard Test Method for Sorbent Performance of Adsorbents".

against collapse. They are chemically and biologically stable if properly harvested and stored.

The conducted Life Circle Assessment showed that, due to the wild and fast growing nature of poplar trees and a high ratio of binding of carbon during growing processes, the use of poplar seed fibers for the production of technological products **expressed a negative carbon foot print and served as a natural reduction for carbon dioxide. Those fibers indeed are the only known sorbent material which expressed a negative carbon footprint on the globe.**

Taking into account PSF's higher sorption compared to the expanded polypropylene and their production from renewable sources, poplar seed fibers are environmentally much more sustainable than other synthetic sorbent materials existing on the market.

A comparison analysis conducted on different sorbent absorbants showed that poplar seed fibres are 7.5-fold more efficient than expanded polypropylene, which is the industry standard for water surface recovery. Poplar seed fibres, kapok seed fibres, silanized cellulose and expanded polypropylene fully passed the degradation test in accordance with the ASTM 726-06 "Dynamic Degradation Test".

At the moment the main barrier for commercialization are the harvesting processes. Still we must assure critical quantities of raw material needed, expanding the harvesting network and improving of harvesting technology.

Use of poplar seed fibers for super sorbents and ultra-light insulation and packaging material is the first known use for production of advanced materials with high added value with low carbon footprint. It is an interesting example of how a "waste" of agriculture is exploited for production of advanced materials with high added value and low carbon foot print which can be used in different public and industrial sectors as in medicine, disaster relief services and in construction, oil, chemical and logistic industry. Indeed they can replace expensive and complex synthetic materials.

Please kindly watch this video [www.youtube.com/watch?v=qtX0MsNZONY](http://www.youtube.com/watch?v=qtX0MsNZONY) for further information.

## Five Years Performance Of New Introduced Salt Tolerant Hybrid Poplar (Populus Euphratica Oliv. × P.Alba L. Andpopulusalba L. × P.Euphratica Oliv) In Iran (West Azar-Bayjan)

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## Abstract

In order to introduce new poplar hybrids (*Populus euphratica* Oliv. × *P. alba* L. and *Populus alba* L. × *P. euphratica* Oliv.) in different part of country, ecological range of productivity have to be determined. In this study, adaptability of *Populus euphratica* Oliv. × *P. alba* L. and it's reciprocal crosses hybrid, along with *Populus alba* L. as native clones were tested in Rasol Research station belong to Central Research of Agriculture and Natural Resources of West Azar-Bayjan during (2004-2009) The experiment was conducted through randomized complete block experimental design (RCBD). Twenty five individual cutting of three clones (Two hybrid and one native clones) planted in 100 square meter (2 × 2 meter distance between rows and space between cutting respectively) as an experimental unite and replicated three. Analysis of collected data have been done base on quantities and qualitative dates during five years. The results indicated that there were a significant differences between clones at  $\alpha=0.01\%$ . *Populus euphratica* Oliv. × *P. alba* L. hybrid showed highest breath diameter height (11.30cm), and total height (10 meter) than the others two. Low level of breath diameter height (4.15 cm), and total height (5.5 meter) were observed for *Populus alba* L. clone as a control.

**Key Words:** hybrid poplar, inter specific hybrid, *Populus euphratica* Oliv. × *P. alba* L., *Populus alba* L. × *P. euphratica* Oliv.

## INTRODUCTION

Iran belongs to low forest coverage countries (LFCC). Total forest area in Iran is estimated 12.4 million hectares but only 1.2 million hectares can be considered as commercial forest. Poplar produced highest wood (1.5 million m<sup>3</sup>) than the wood which are produced by forests and other wood production sources (Jallili, 2009). Therefore wood production through fast growing trees especially poplars, became an urgent task of our government. Among poplar trees, *Populus euphratica* Oliv. has been showed, varying degrees of tolerance to

the salinity, periodic water longing, cold and arid conditions (Kalagry et al., 2000). Unfortunately, overuse has removed many of the stems of better form, so that natural stands now usually appear small and crooked (Jafari et al., 1998). Inter-specific hybrid between *Populus euphratica* Oliv. and *P. alba* L. have been produced into direction in Iran (Jafari Mofidabdi et al., 1998; Jafari Mofidabadi and Modir-Rhmati, 2000). Due to various reaction of plants in different climate conditions and its economical products, test of adaptability is an urgent task of breeder particularly for introduction of new hybrid in a given areas. Adaptability of tree in different climate conditions depend to the genetic potential and its interaction with environment factors. In order to introduce new poplar hybrids (*Populus euphratica* Oliv. × *P. alba* L. and *Populus alba* L. × *P. euphratica* Oliv.) in different part of country for poplar wood production particularly in saline soil, ecological range for economically wood production have to be determine. Therefore test of adaptability and its economically wood production of *Populus euphratica* Oliv. × *P. alba* L. and its reciprocal crosses, were studied in Rasol-Abad Salty-soil Research station of Central Research of Agriculture and Natural Resources of West Azar-Bayjan (2004-2009).

Three hundred potted stem cutting of four poplars clones such as *P. alba* L. × *P. euphratica* Oliv., *P. euphratica* Oliv. × *P. alba* L. and two *P. nigra* L., *populus alba* L. as a local clones were planted in Salty-soil Rasol abad Research station belonging to Research Center of Agriculture and Natural Resources of West Azar-Bayjan (2004-2009). in province. The experiment were conducted based on Complete Randomized Block Design (RCBD) with 3 replications. Seventy five potted stem cutting were planted in a three rows with 250 centimeter row-spacing and 200 centimeters space between cutting as an experimental unit. Analysis of variance and mean separation of collected dates were carried out for total height, diameter at breath height trunk height, cold and pest resistance.

There were highly significant differences between clones for height at  $\alpha=0.01$  level. Highest growth

**Table 1.** Mean comparison of different characters of four poplar clones

| Clones                                             | No | Height(M) |        | Dbh (cm) |        | Survivable rate (%) |
|----------------------------------------------------|----|-----------|--------|----------|--------|---------------------|
|                                                    |    | Mean      | Record | Mean     | Record |                     |
| <i>P. euphratica</i> × <i>P. alba</i>              | 75 | 5.85 a    | 10     | 5.98a    | 11.30  | 97.5a               |
| <i>Populus alba</i> L. × <i>P. euphratica</i> Oliv | 75 | 5.67a     | 9.35   | 5.75a    | 10     | 87a                 |
| <i>P. alba</i>                                     | 75 | 2.95b     | 5.5    | 2.45b    | 4.15   | 84b                 |

The same letters indicated no significant different at  $\alpha=0.01$  level

were observed for *Populus euphratica* Oliv. × *P. alba* L.. (average 10 meters) while *Populus alba* L. with 5.5 meters showed lowest level of height growth (Table .1 and Fig.1).

There were highly significant differences between clones for diameter breath height (dbh)  $\alpha=0.01$  level. Highest diameter at breath height was observed for *Populus alba* L. × *P. euphratica* Oliv. (11.30 cm) while *Populus nigra* L. showed lowest level of diameters at breath height (4.1 cm). No significant differences were observed between *Populus. alba* L. × *P. euphratica* Oliv. and *Populus euphratica* Oliv. × *P. alba* L hybrids. *Populus. alba* L. × *P. euphratica* Oliv. with 9.35 meter height and 10 centimeter diameter breath height showed its superiority to the *Populus alba* L. clone as a local tree.

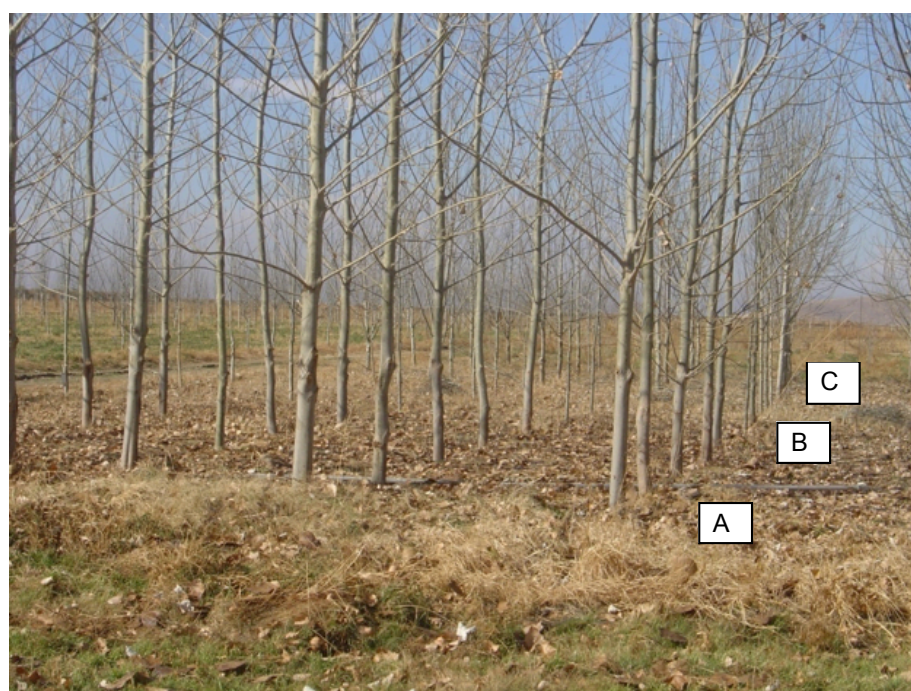
Superiority of inter and intra-specific of poplar hybrid against local clones, have been caused successfully wood cultivation development in the country (Jafari et al., 1998). Narrow and broad senses adaptability trail of *Populus euphratica* Oliv. × *P. alba* L. and its reciprocal crosses are being tested through country for maximum use of heterotic effect in wood production (Ghemeri-Zareh, 2008).

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**Figure 1.** Five year performance of *Populus euphratica* Oliv. × *P. alba* L., *Populus alba* L. × *P. euphratica* Oliv. and *Populus alba* L. in Rasol-Abad Salty-soil Research station belong to Central Research of Agriculture and Natural Resources (West Azar-Bayjan Province)

A= *Populus euphratica* Oliv. × *P. alba* L.  
B= *Populus alba* L. × *P. euphratica* Oliv.  
C= *Populus alba* L. (local clone)

## Why does the English willow make the best cricket bat?

Article published on 8 May 2015 in the Newsroom of the Australian National University website ([www.anu.edu.au/news/all-news/test-cricketer-brad-haddin-helps-anu-bat-researchers](http://www.anu.edu.au/news/all-news/test-cricketer-brad-haddin-helps-anu-bat-researchers))

Physicists of the Australian National University (ANU) are for the first time studying English willow at the cellular level, to help them understand what makes a top-quality bat and to work out if other types of wood might one day rival the legendary performance of willow. Usually, top quality bats are made from the female of only one particular species of English willow tree.

Australian cricketer Brad Haddin visited the research lab to give his expert opinions on bat quality. "It's great to be back at the University where I started my cricket career, and to make a contribution to a research project like this. Haddin, who played for the Australian National University cricket club in the 90s, tested an English willow bat and then one of Kashmir willow, which is considered to be an inferior bat material. After hitting a number of balls he sawed one of the bats in half to kick off the scientists' sample preparation. The willow samples will be analysed with an extremely accurate computer tomography scanning technique developed for material research at ANU, and processed by a supercomputer. The tests will help to find out why cricket balls rebound so well from willow bats.

Lead scientist Dr Mohammad Saadatfar, from ANU Research School of Physics and Engineering commented: "It's immensely complex. Willow is porous, with criss-crossing fibres that give it the mechanical strength required for withstanding its own weight as well as the wind," said Dr Saadatfar. "Willow has pockets of air trapped inside the cells, which deform elastically when the cricket ball hits it, giving it unique resilient properties. "It's an amazingly beautiful system."

Video interview: [www.youtube.com/watch?v=dhA4uQuKjE](http://www.youtube.com/watch?v=dhA4uQuKjE) 

## MEET MEMBERS OF THE IPC EXECUTIVE COMMITTEE

### Mr. Naldo Anselmi

Mr. Naldo Anselmi has a Master Degree in Agricultural Sciences from the University of Perugia. He initiated his carrier as scientist in tree pathology at the Italian Poplar Research Institute of Casale Monferrato where he spent 14 years, from 1972 to 1986. In 1987



he became Associate Professor in Wood Pathology at the Agriculture Faculty of the University of Turin (1987-2004). In 1993 Prof. Anselmi became full Professor of Forest Pathology at the University of Tuscia, Viterbo and has been PhD Co-ordinator of the course on plant protection from 1995 to 2006. From 2007 to 2010 he was the Head of Plant Protection Department. Prof. Anselmi has also a good international background: in 1996 he taught tropical Plant Pathology at the University of Maputo, Mozambique and from 2003 to 2006 he was expert pathologist to the ALC Agri-Livestock (NL)-EU project on "Strengthening of Phytosanitary Services Technical Assistance" in Montenegro and Macedonia.

From 2000 to 2002 he was nominated "associated editor" of the Journal of Plant Pathology and from 2011 is member of Editorial Board of the "Journal Agriculture and Forestry". Prof. Anselmi is author of 370 papers on Forest Pathology, including about 120 papers on Poplar and Willow. He is member of the National Poplar Observatory of Italy, member of the Forestry Academy of Florence (Italy) and, at the 24<sup>th</sup> Session of the International Poplar Commission held in India in 2012, he was elected member of the Executive Committee.



## Mr. Jim Carle

After more than 3 decades living and working in developing countries, including 15 years with the Food and Agriculture Organization of the United Nations (FAO), Mr. Jim Carle retired in 2011 as Chief, Forest Resources Development Service, FAO, Rome, Italy. He returned to New Zealand and reactivated JB Carle & Associates to provide consulting to international agencies (the World Bank, FAO, IFAD, ITTO, GEF) on different dimension of forests, trees and people in the context of climate change. Mr. Jim Carle was the Secretary of the IPC from 2001-2009. Following his retirement he prepared a discussion paper detailing reform options for the IPC considered by the Executive Committee. At the IPC Session in India in 2012, Mr. Carle was elected as a co-opted member of the Executive Committee and received an award in recognition of services to the IPC. Mr. Carle has worked with the public and private sectors, non-governmental organizations, inter-governmental organizations, academics, scientists and civil society. In his work in more than 50 countries, he has faced a diverse range of cultural, social, religious, language and physical contexts and different technical demands of forest ecosystems in Temperate and Boreal, Arid and Semi-Arid, Tropical and Sub-tropical ecotypes in all regions of the world. ■



## IPC Poplars and Willows book

We are pleased to inform you that the electronic version of the "Poplars and Willows" book is now available for free download, in the IPC webpage, at the following URL: [www.fao.org/forestry/ipc/69946@158687](http://www.fao.org/forestry/ipc/69946@158687)

## New publication

A new publication has just been released in Russian language authored by one of the IPC participants: "Breeding of forests and decorative tree plants" 2014 ([www.fao.org/forestry/43118-04af951aa09fecf80facd1628dd681fec.pdf](http://www.fao.org/forestry/43118-04af951aa09fecf80facd1628dd681fec.pdf)), by Tsarev, Anatoly Petrovich; Pogiba, Svetlana Petrovna; Laur, Natalia Vladimirovna.

The book is published by "Publishing house of Moscow State Forest University". Interested people into the publication, may contact the author at the following email: [tsarev@psu.karelia.ru](mailto:tsarev@psu.karelia.ru) or [antsa\\_55@yahoo.com](mailto:antsa_55@yahoo.com)

## National Poplar Commission Argentina, website

The National Poplar Commission of Argentina has just launched the new official website of <http://salicaceas.blogspot.com.ar>

This renovated site has different sections which include news on Salicaceae in Argentina and general information. A section is dedicated to the "Salicaceae Symposium" an international meeting organized by the Commission which take place every two years in Argentina. From the site it is also possible to download all the Newsletters of the National Poplar Commission of Argentina and the "Poplar and Willow News" of the International Poplar Commission FAO. In a dedicated section it is possible to subscribe and receive all the news from the official site through the mail. We invite you to visit the website and get to know it.

## NEWS OF THE INTERNATIONAL POPLAR COMMISSION (IPC)

### 25th Session of the International Poplar Commission

We are pleased to inform you that the First Announcement of the 25<sup>th</sup> Session of the International Poplar Commission in Berlin 2016 has been uploaded at the following websites:

German host website: <https://ipc25berlin2016.com> (in English)

FAO website: [www.fao.org/forestry/88828](http://www.fao.org/forestry/88828) (in English, French, Spanish)

## National Poplar Commission Italy

The National Poplar Commission Italy has been recently restructured and renamed. The new body is now called Osservatorio Nazionale per il Pioppo (National Observatory for Poplar). Although member institutions of the Observatory are still the same and represent all the Italian stakeholders related to poplar, including both public and private sector, the technical secretariat has been moved from the National Forest Service to the Ministry of Food, Agriculture and Forestry Policies. However the National Forest Service is still one of the member institutions of the Observatory. The Observatory has appointed a coordinator, Mr. Pietro Gasparri and a responsible person for the Secretariat, Mr. Alberto Manzo. In thanking both Mr. Federico Radice Fossati and Ms. Lorenza Colletti, respectively Chair and Secretary of the last Italian Poplar Commission, for the excellent work conducted in representing Italy within the IPC, the International Poplar Commission welcomes the new colleagues and wishes them all the best to continue representing Italy within the international community of the poplar stakeholders.

Zoran Galic

Link: <http://link.springer.com/article/10.1007/s11676-015-0040-1>

Agroforestry Systems

January 2015

Date: 09 Jan 2015

Carbon sequestration potential and cost-benefit analysis of hybrid poplar, grain corn and hay cultivation in southern Quebec, Canada

Kiara S. Winans, Anne-Sophie Tardif, Arlette E. Lteif, Joann K. Whalen

Link: <http://link.springer.com/article/10.1007/s10457-014-9776-4>


BioEnergy Research

March 2015

Date: 04 Mar 2015

Allometric Biomass, Biomass Expansion Factor and Wood Density Models for the OP42 Hybrid Poplar in Southern Scandinavia

Anders Taerøe, Thomas Nord-Larsen, Inge Stupak, Karsten Raulund-Rasmussen

Link: <http://link.springer.com/article/10.1007/s12155-015-9592-3> 

## RESEARCH WORK IN POPLAR AND WILLOW

Journal of Forest Research

March 2015

Date: 29 Mar 2015

Response of sap flow to flooding in plantations of irrigated and non-irrigated triploid poplar

Xiao-Li Yan, Ben-Ye Xi, Li-Ming Jia, Guang-De Li

Link: <http://link.springer.com/article/10.1007/s10310-015-0485-2>

Journal of Forestry Research

March 2015, Volume 26, Issue 1, pp 225-231

Date: 21 Jan 2015

Natural infectious behavior of the urediniospores of *Melampsora larici-populina* on poplar leaves

Zhibing Wan, Yiran Li, Min Liu, Yingnan Chen, Tongming Yin

Link: <http://link.springer.com/article/10.1007/s11676-015-0021-4>

Journal of Forestry Research

March 2015, Volume 26, Issue 1, pp 143-151

Date: 27 Jan 2015

Application of pre-emergence herbicides in poplar nursery production

Verica Vasic, Sasa Orlovic, Predrag Pap, Branislav Kovacevic, Milan Drekić, Leopold Poljakovic Pajnik,

**We invite you to participate with articles, papers, progress in research, discussions of papers, interviews, etc. emailing to:**

[salicaceas@gmail.com](mailto:salicaceas@gmail.com)

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