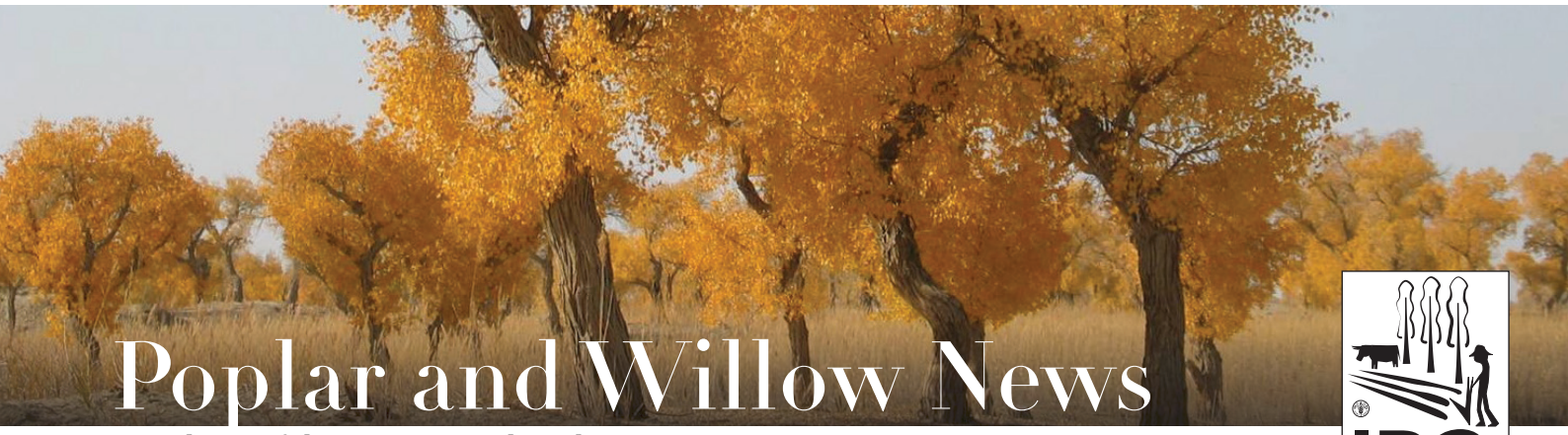
Food and Agriculture Organization of the United Nations



Poplar and Willow News

Newsletter of the International Poplar Commission

Issue Nº 6, February 2016

IPC INTERNATIONAL POPLAR COMMISSION

Dear readers,

Welcome to the Newsletter of the International Poplar Commission (IPC) of the Food and Agriculture Organization (FAO) of the United Nations.

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 and research in poplar and willow.

This space also aims at informing and reviewing the main activities of the IPC and other organizations with the objective of spreading useful information that may be of interest to the whole community of the Salicaceae.

The newsletter also includes a section of publications with the aim of presenting papers, abstracts, books, and new research, among other things.

We invite you to participate with articles, papers, research reports, interviews, etc. Kindly submit to salicaceas@gmail.com

The editorial committee

UPCOMING EVENTS

Short rotation woody crop science and technology in an uncertain global marketplace

11th Biennial
Short Rotation Woody Crops
Operations Working Group Conference
October 11-13, 2016
Fort Pierce, Florida

The Short Rotation Woody Crops Operations Working Group is hosting the 11th Biennial Conference on Short Rotation Woody Crop Science and Technology in an Uncertain Global Marketplace. This meeting is a unique opportunity for scientists and engineers from around the United States to assemble and share ideas regarding Short Rotation Woody Crops.

Please check website at www.woodycrops.org

For questions regarding the SRWCOWG Conference, please contact Jessica McCord at jfox16@utk.edu or 865.974.7370.

Short rotation woody crops (SRWC) are being developed as a sustainable supply of woody biomass for the production of bioenergy, biofuels and bioproducts as well as for traditional solid wood and fiber products.

Recent developments in short-rotation production and harvesting for hardwoods and pine, are of interest. Also, discussion of emerging market opportunities, expanded utilization potential, and remaining challenges will be emphasized at the conference, as well as environmental and social implications of using SRWC to achieve multiple goals. Topic areas include:

- SRWC to Advance Social and Environmental Sustainability
- Attributing value to external benefits of SRWC systems
- Creative uses of SRWC to achieve environmental and social goals
- Improvements in harvesting technology and productivity
- Adding value throughout the biomass supply chain
- Stabilizing, upgrading, and standardizing SRWC feedstock quality
- Genetic and tree improvement status of today's crops
- Optimizing SRWC production systems

PAST EVENTS

XIV World Forestry Congress

The outcomes of the XIV WFC that took place in Durban, South Africa, from 7 to 11 September 2015, are available at the following url:

http://forestry.fao.msgfocus.com/q/1bw4fI1ffbxMOu1I65M/wv

ARTICLES OF INTEREST

Key roles of the poplar microbiome

By Sharon L. Doty, University of Washington

The microbiome of plants is diverse, and like that of mammals, is important for overall health and nutrient acquisition (3). One of the most important

nutrients required is nitrogen. Although the majority of the air we breathe is dinitrogen gas, it is unavailable until it has been "fixed" into a usable form. In legumes and actinorhizal plants, nitrogen is obtained through symbiosis with root nodule-inhabiting, N-fixing microorganisms. For non-nodulating plants, however, recent evidence points to symbiosis with internal microorganisms, termed endophytes, as a mechanism for plants to obtain essential nitrogen (16). These microbes are not limited to the nodules on roots of specific plants but rather can live throughout the plant including in the branches and leaves. N-fixing endophytes have been isolated from such varied species as kallar grass (15), sugarcane (2), and conifers (1,4). Despite decades of research on endophytic N-fixation, the idea that symbiotic N-fixation can occur without root nodules is still considered controversial. Recent research on the endophytes of sugarcane unequivocally demonstrated N-fixation in a model grass system (14).

Members of the Salicaceae family, including poplars (*Populus* sp.) and willows (*Salix* sp.), are early successional tree species able to colonize nutrient-poor environments, and are increasingly important for bioenergy, wood products, and environmental services (7). A common natural habitat for poplar and willow is the riparian zone where regular flooding deposits cobble and sand, creating new substrate for colonization (17). We isolated a variety of N-fixing endophytic species from wild poplar and willow at a natural riparian area dominated by cobble (5). These endophytes were shown to be beneficial by adding them to other plant species, including grasses (18), corn (12), rice (8), a variety of crop plants (9), and the commercially-important conifers, Douglas-fir and western red cedar (10), resulting in improved growth and health in nutrient-limited conditions.

Not only do the microbial endophytes increase plant growth, they also increased the fruit yields of two varieties of tomato and of bell pepper (9). When the endophytes from wild poplar and willow were added to hybrid poplars under greenhouse conditions, growth, and N-fixation were increased (13). Hybrid poplar inoculated with the endophytes also had substantially increased drought tolerance (11). We recently quantified N-fixation in wild poplar (6), representing an important step towards understanding the functional importance of the microbiota of plants in a natural setting. With the broad host specificity of endophytes compared to nodule bacteria, there are profound opportunities for bioenergy plantations, agriculture, and forestry in light of global climate change through tailoring of the plant microbiome for reduced inputs of chemical fertilizers and water.

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Growing poplars at low latitudes: Zimbabwean experience

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The natural distribution of *Populus* spp. is in temperate region above 28 degree latitudinal limits of northern and southern hemispheres. Much information is not available on commercial growing of poplars at low latitudes and away from their natural distribution range. Zimbabwe- a central African tropical country has been growing poplars for quite some time. The information related therewith is hardly available outside the country. This report is based on the author's visit to Zimbabwe on the request of Forestry Commission, Harare during late May and early June, 2015 to explore the expansion of polar culture in that country. During the visit poplar trees/ plantations were recorded at number of locations, some of them are given in the table below.

Table-1. Locations (with land coordinates) having poplar trees/ plantations.

Spots	Locations	Altitude (a.m.s.l.)	Latitude (South)	Longitude (East)	Average Annual	
					Temp.	Rainfall
1	Erin forest, JN , AT	1755 m	18°22'54"	32°41'39"	14.2 °C	1173 mm
2	Erin forest,JN, AT	1858 m	18°23'11"	32°43'52"	14.2°C	1170 mm
3	Imbeza, PM,BT	1198 m	18°54'10"	32°41'33"	19.4 °C	809 mm
4	Charter estate, CD, BT	1217 m	19°51'21"	32°47'04"	16.0 °C	1210 mm
5	Martin Forest, CD, AT	1260 m	19°45'17"	32°56'29"	16.0 °C	1210 mm
6	JMFRC	1890 m	18°43'23"	32°50'19"	14.2 °C	1340mm
7	Community Forest	690 m	18° 52'36"	32°55'36"	15.5°C	1170 mm
8	Stapleford Estate AT MD	1520 m	18°45'13"	32°16'42"	14.8°C	1250 mm
9	FC Estate Harare	1448 m	17°47'96"	31°05'08"	17.9°C	825 mm

AT: Allied Timbers
BT: Border Timbers
ND: Nyanga District
JD: Juliasdale District
MD: Mutasa District
PM: Penhalonga
CD: Chimannimani District
FC: Forestry Commission
JM: John Mikel

The entire country is divided into five zones based on climatic conditions and farming systems. The locations having poplar trees/plantations were in Harare (Zone IIa), Mutare (IIb, III), Chimannimani (III and IV) and Nyanga (IIb). Zone IIa and IIB represent intensive farming systems with rainfall ranging upto 1000 mm, Zone IIb more drier than Zone IIa. Zone II has less rainfall upto 800 mm and Zone IV even upto 650 mm.

Poplar has been located as isolated trees, in group of a few trees, a large plantation numbering over a thousand trees, and naturally regenerated invasive ecosystem of white/Grey poplar in number of locations. Poplar (*P. deltoides*), as a single tree was located in the lawn of a building at Spot No.1, a couple of trees at Spot No. 1 and also as homestead ornamental trees (*P. alba/ P. x canescens*) planted inside Harare city (Spot 9). Except for P.alba/*P. x canescens* which has been regenerated from root suckers, others are planted ones. The major population of poplar located during the visit was on hydromorphic sites (near river beds) with an exception of a few cases like the one planted in the Estate of Forestry Commission (Spot No. 9) and around some houses in Harare city those being on upland (Plate-III). Trees of large dimensions of over 35 m height and over 1 m in diameter were recorded near hydromorphic sites, whereas, growth of the trees planted on uplands was poor. Trees away from hydromorphic sites on uplands were drying/dried and in some cases were also found fire-burnt. *P. alba/ P. x canescens* located on hydromorphic sites was of largely bushy growth. Based on the existing information collected during the field visit and the Library of Forestry Commission, Harare on poplar introductions and culture, the following four types are distinguished.

1. **Trees with corky bark and without leaves:** This type was recorded at maximum sites and was one of the productive types among the existing plantations. This type was recorded on both hydromorphic sites and uplands (Plate-I).
2. **Trees with smooth bark and without leaves:** This type having whitish and smooth bark was located at only Spot No. 3 (Plate-II). This plantation was on hydromorphic site.
3 **Fastigiate type with leaves:** This type was also recorded only in one location (Spot No. 4). There were only three scattered trees on the boundary of agriculture field near to the nursery of Borders Timber (Plate-II). The trees were in lush green foliage, with narrow crown and upright branches starting from a very low position on the main stem.
4 **Bushy poplar with tomentoes and lobbed leaves:** This type has the largest population among existing trees/plantations in the country (Plate-1II). It has been located in number of locations those include, Spot No. 2, 4, 8, 9. In Harare city, it has been planted as ornamental tree around some houses. At spot No. 9, it covers around 10 ha area along

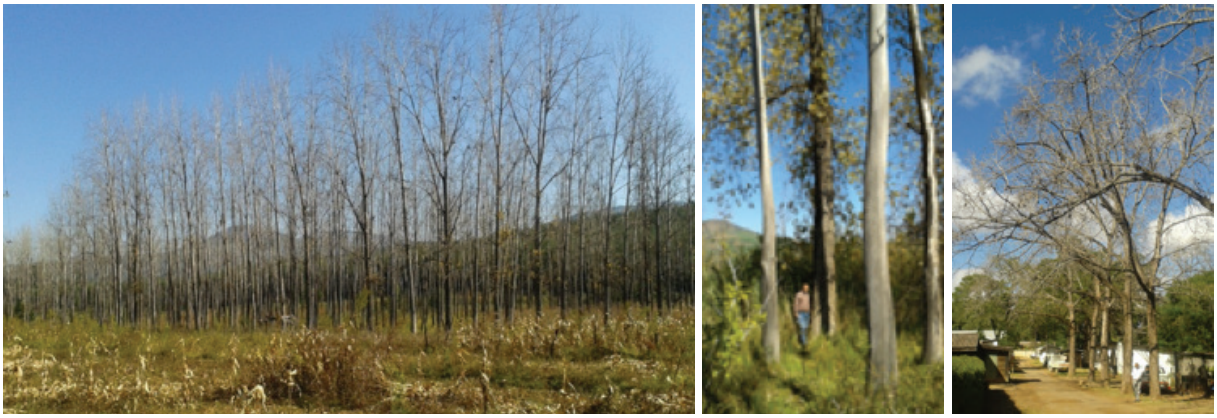

Plate-I. Left(A)- Poplar plantation in the Charter Estate of Border Timber, Chimanimani District-reportedly planted during 1989; Centre(B)- Trees near water source grew to large dimensions, others away from hydromorphic sites are dying/drying; Right(C)- Around three dozen surviving trees planted during 1975 on upland in the Estate of Forestry Commission, Harare.

Plate-II. Left(A): A good growing stand (Spot No. 2); Right(B)- Tree with lush green foliage at Spot No. 4.

Plate-III. Left(A)-*P. alba/ P. x canescens* at Stapleford Estate of Allied Timbers (Spot-); Right(B)- *P. alba./ P. x canescens* on road side in Harare city.

the river bed around the Stapleford Estate. The trees/bushes of this type were in foliage in all the visited sites. The species here and in many other locations has become invasive. This type represents *P. alba* and/or *P. x canescens* and the earlier three types were of *P. deltoides* or its hybrids with other species.

Zimbabwe does not represent natural range for any of the existing *Populus* species. Available records in the Library of Forestry Commission, Harare mentions introduction of 500 cuttings of *P. deltoides* in 1921; 900 rooted cuttings of *P. deltoides* in 1964, Clone I-214 and I-455 of *P. x euromericana* in 1965: and clones JM 248, JM 249, HV 70 and HS(T) 99 in 1989. A guide to poplar planting in Rhodesia (176.1-232.4(689.1) maintained in the Library of Forestry Commission, Harare mentions that three *Populus* species viz., *P. x canescens*; *P. nigra* L cv. *semepervirense*; and *P. deltoides* are found in Rhodesia. Sixteen Annual Report & Account of Rhodesia Forestry Commission for the year 1970 carried a photograph of good growing trees of *P. deltoides* clone 60/110(JM 544) on the Nyamukwarara river-Altitude 2290 feet aged two years and four months. Flora of Zimbabwe reported occurrence of five *Populus* species viz., *P. deltoides* Marsh, *P. alba* L, *P. maximowiczii* A. Henry, *P. nigra* L., and *P. x canescens* (Ait). Flora further mentions occurrence of *P. deltoides* and *P. x canescens* at two locations, i.e., one around Harare and another at Grestone Park Nature Reserve, Harare located around 1500 m above mean sea level and at around 17o 45' S Latitude and 31o 07' E Longitude.

A very limited data is available on the tree growth. In one of the report of the Rhodesia Forestry Commission, the growth of 1, 2, 3, 4, 5, 10, 15, 20, and 25 years old poplar is reported as 6' and 0.79", 9' and 1.30", 15' and 3.40", 18' and 3.60", 24' and 4.70", 58' and 10.1", 77' and 13.7", 93' and 16.5", and 107' and 18.3" for height (feet) and dbh

(inches) respectively. These indicate that the growth of poplar is subnormal compared to many of the same age plantations in many countries including India where good growing poplar plantations attain an average height of 4-5 m and diameter of 4-5 cm per year. One reason of poor growth in this country could be low management inputs. In a large number of locations, the locals reported that hardly any input was provided to these plantations after planting.

Zimbabwe has land coordinates between 15° and 23°S Latitude, and 25° and 34°E Longitude. Most of its geographical area is elevated in the central plateau (high veld) stretching from the southwest to the northwest at altitudes between 1,200 and 1,600 m. The country's east region is mountainous with Mount Nyangani as the highest point at 2,592 m. The country has a tropical climate with a rainy season usually from late October to March. From the existing poplar trees/plantations in the country, it is inferred that poplars can be successfully and commercially grown at low latitudes if temperature is moderated by higher altitudes.

Like Zimbabwe, There have been some successful attempts of growing poplars at low latitudes in some other countries especially in India and Brazil for matchwood production. Some introduced poplars in the Botanical garden Ooty, Coimbatore, Tamil Nadu, India exists at11oN latitude. The Botanical garden is located at altitudes between 2000 to 2500 m above mean sea level, receives 1400 mm rainfall and temperature varies from 0 to 28 oC in the Niligiri hill range. Similarly, poplar has been grown by the Raipur Agriculture University, Chhatisgarh, India at 21oN latitude. Swedish Match Brazil has been growing poplars at 25-26°S Latitudes for many years.

Poplar in Zimbabwe was initially introduced for ornamental planting and latter on for matchwood production. Lions Match has made most of the introductions from its sister concern of South Africa. Some plantations were reportedly harvested and match wood used in local match factory. Intensive poplar culture especially with its integration with intercrops could help in better growth and in reduction in its harvesting age. There is also a need to expand its utilization base from match splints to manufacture other wood products for expanding its culture.

General interest

Scientists create bigger, faster-growing trees in a bid to beat climate change

Experts at Manchester University altered two genes to accelerate growth in poplar trees and say the research could help crop production and renewable energy

Trees that grow twice as fast as normal have been developed by scientists, in a bid to boost renewable energy and tackle climate change.

They manipulated two genes to accelerate cell division in poplar trees, which were also bigger and had more leaves.

The research, published in Current Biology, could boost biomass energy and help climate change-hit areas.

Researcher Prof Simon Turner of the University of Manchester said: "This needs to be tested but offers a potential way forward for one of the most pressing challenges of the day."

He added: "The rate at which trees grow is determined by the rate of cell division in the stem. We have identified two genes that are able to drive cell division in the stem and so override the normal growth pattern.

"This discovery paves the way for generating trees that grow more quickly and so will contribute to meeting the needs for increased plant biomass as a renewable source of biofuels, chemicals and materials while minimising further carbon dioxide release into the atmosphere."

The genes, called PXY and CLE, control the growth of a tree trunk, the research found.

When overexpressed, the trees grew twice as fast as normal and were taller, wider and had more leaves.

The team now plans to work with a forest products company to test their research.

Link: http://www.mirror.co.uk/news/scientists-create-bigger-faster-growing-trees-5540098

MEET MEMBERS OF THE IPC EXECUTIVE COMMITTEE

Mr. J. G. Isebrands

J. G. Isebrands (Jud) is native of the state of Iowa, USA and a graduate of Iowa State University with a degree in Forestry and PhD in Forest Science. He was a former project scientist, project leader and program manager with the US Forest Service Research Division where he worked on poplar physiology and genetics, short rotation poplars and willows for wood and energy, and climate change. He completed a sabbatical at the University of Washington, Seattle where he worked a number of years with a team of scientists on improving poplar clones for short rotation culture. He also served as an adjunct faculty member of several American forestry schools including Iowa State University, Michigan State University, Michigan Tech University, University of Florida and University of Minnesota. He has over 200 publications on poplars and willows, including co-editor of the recent FAO book on Poplars and Willows. He is the President and founder of Environmental Forestry Consultants, LLC in New London, Wisconsin, USA. The company specializes in phytoremediation and short rotation forestry projects with poplars and willows. He is currently on the Executive Committee of the International Poplar Commission of the FAO having served for 15 years including over 10 years as Vice Chairman. He and his wife Sharon O'Leary live on a small farm near New London, Wisconsin, USA.

NEWS OF THE INTERNATIONAL POPLAR COMMISSION (IPC)

25th Session of the International Poplar Commission

Berlin, Germany, 13 to 16 September 2016

25th Session of the International Poplar Commission (IPC), which will be held in Berlin, Federal Republic of Germany, jointly hosted by the German Federal Ministry of Food and Agriculture and FAO from 13 to 16 September 2016. The Session will be preceded by the IPC 48th Executive Committee Meeting on 12 September 2016. There will be pre- and post-session field trips to view a range of poplar and willow research, production, protection and wood processing options. Formal invitation letters will be issued in due course.

The second Announcements of the 25th Session is available on the IPC website at the following url: http://www.fao.org/forestry/ipc2016/90948/ and on the German host website: https://www.ipc25berlin2016.com.

Authors are encouraged and welcome to submit papers or poster abstracts on the theme of the Session "Poplars and Other Fast-Growing Trees - Renewable Resources for Future Green Economies". Guidelines for Papers and Poster abstracts are available at the following url: http://www.fao.org/forestry/ipc2016/90588/en

The National Poplar Commissions are requested to prepare a country progress report (2012-2015) covering the period since the 24th Session in 2012 in India. Country progress reports will provide the basis for a synthesis report that will be elaborated and presented at the 25th Session of the Commission.

The preparation and dissemination of the country progress reports is an important aspect of the IPC's transfer of knowledge and technology activities since they provide information for items on the agenda of the Session and facilitate technical exchanges between IPC stakeholders in member countries. The exchange of scientific information and materials on technical, social, and economic aspects of Poplar and Willow culture between scientists, producers and users within and between countries are key

functions of the IPC. Thus, we stress the importance of submitting country progress reports for the forthcoming IPC Session.

The national reporting guidelines and questionnaire are available electronically for download at the FAO-IPC 2016 website

http://www.fao.org/forestry/ipc2016/90588/en.

Please submit an electronic version of your country progress report and questionnaire to the IPC Secretariat (IPC-Secretariat@fao.org) by 30 April 2016. Should you have any queries related to the questionnaire, please direct these to Mr. Walter Kollert, IPC Secretary (walter.kollert@fao.org).

NATIONAL POPLAR COMMISSION CHILE

Meeting to revive the National Poplar Commission of Chile held at the Poplar Technology Center, University of Talca

The meeting, jointly organized by the Poplar Technology Center (CTA), University of Talca, and the National Forestry Corporation (CONAF), was attended by the main poplar stakeholders of Chile: entrepreneurs of the wood category, small producers, representatives of municipalities, members of the College of Forestry Engineers, CONAF, INFOR, and representatives of Forestry universities.

A keynote, titled "Meeting to reactivate the National Poplar Commission of Chile", was given on the history of the CNA and the relevant role played in support of the poplar sector in Chile in the past years. The keynote highlighted the role of poplar, considered the third economic resource of forestry in the country, and stimulated a very participated debate on the future of this cultivation in the Chile and the role that it can play in the world.

Participants stressed the importance to strengthen and revitalize the Commission as a mean to promote the cultivation of new Chilean varieties of poplar, in support of the poplar sector. Roberto Cornejo, CONAF current Executive Secretary of the CNA, reported that scientific researches and field knowledge confirm that poplar is a viable option of economic importance for the country. He also commented that "We are still in time to develop strategies and work plans in order to overcome the limitations that currently exist for forest owners, and improve poplar productivity and forest resources".

At the end of the meeting, it was established a committee in charged to draft a work plan to promote the cultivation of new varieties of poplar in Chile.

November 3, 2015

Source:

http://www.utalca.cl/link.cgi//SalaPrensa/Investigacion/9482#sthash.0b3LDTqE.dpuf

http://www.utalca.cl/link.cgi//SalaPrensa/Investigacion/9482

New members of the National Poplar Commission Chile are:

- Aarón Cavieres Chief Executive of CONAF, President
- Roberto Cornejo, CONAF, Executive Secretary
- Directors:
  - Jaime Venegas, Forest manager CAF El Álamo Ltda.
  - Jorge Gándara, Guild Sector CIFAG.
  - Francisco Zamudio, CTA- UTALCA.
  - Two Private forest owners of forest, still to be identified.

The Poplar Technology Center (CTA) launches its first Newsletter

The Poplar Technology Center (CTA) of the University of Talca in Chile, has released the first newsletter. We invite you to read the newsletter published with a summary of the achievements and challenges of the Center during 2014. The bulletin also contains an article on "Project FIC-Maule Alamos" carried out by the CTA, a note written by the Project Manager and news on research developed by the CTA reported by other articles of interest.

We cordially invite you to read the newsletter by clicking here:

https://drive.google.com/file/d/0B8sQ0ENPmarPOXp0dS1CWDVOY1E/view

RESEARCH WORK IN POPLAR AND WILLOW

Productivity of poplar short rotation coppice in an alley-cropping agroforestry system

Agroforestry Systems

Justine Lamerre , Kai-Uwe Schwarz, Maren Langhof, Georg von Wühlisch, Jörg-Michael Greef

October 2015, Volume 89, Issue 5, pp 933-942

Link:

http://link.springer.com/article/10.1007/s10457-015-9825-7?wt_mc=alerts.TOCjournals

Doctoral thesis:

Birger Hjelm

Department of Crop Production Ecology, Swedish University of Agricultural Science, SLU Uppsala Sweden

Empirical models for estimating volume and biomass of poplars on farmland in Sweden

http://pub.epsilon.slu.se/11707

A brief summary:

The New production models for fast-growing poplar in Sweden presented in this thesis can be of great importance as a tool for forest companies, farmers , forest owners, bio energy companies and stakeholders, div contractors, consultants and researchers, etc.

The production models can be used to estimate volume and biomass of individual poplar trees or on plantation level and in improve planning operations and management of poplar plantations and also be used in economic calculations .

- Fast-growing poplar has a great development potential in Sweden , not least as a future bioenergy resource .

The introduced Poplar species in Sweden grown mainly for bioenergy and pulpwood production . It is one of those tree species that have recorded the greatest growth in our country.

One of the developed models in the thesis can also be used to estimate stumps and roots biomass in poplar plantations , which have been shown to contain substantial biomass. But before start using the resource in a larger scale, the environmental consequences are necessary to be better evaluated first.

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

salicaceas@gmail.com