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Season's Greetings!

On behalf of the CPBIS management team and the entire body of CPBIS faculty, staff and students, I extend best wishes for this holiday season to all of our newsletter readers. We value your continued interest in the Center's work as we strive to help meet the industry's research, education, and outreach needs. During this joyous season, we hope that your travels are safe and your holidays relaxing.

*With warm regards,
Pat McCarthy, Director*

Trees that Multitask

Phytoremediation is a term that is obviously not in common everyday use. Less apparent than other uses of trees, such as serving as building material or raw material for pulp and paper manufacture, phytoremediation is defined as the use of trees or other plants and their associated microorganisms to stabilize or reduce contamination in soils, sludges, sediments, surface water, or ground water.

Two relevant examples cited by the US Environmental Protection Agency are the Oregon Poplar Site and J-Field at Aberdeen Proving Ground. The Oregon Poplar site, located in Clackamas, Oregon had been an abandoned grassy field contaminated with volatile organic compounds (VOCs). Hybrid poplar trees were planted on the site in 1998. By 2002 the trees had not only survived, but had shown considerable growth. Tissue samples taken from four of the trees indicated that the trees were actively removing VOCs from the ground water and soil. The once toxic pits of J-Field,

in Maryland's Aberdeen Proving Ground, had been used as a disposal site for chemical warfare agents, munitions, and industrial chemicals. Hybrid poplar trees were planted there in 1996. Since then analysis of leaf tissue and gas and water vapor expelled by the trees has indicated that the poplars are removing, degrading, and releasing the contaminants of concern. Sap flow rates and shallow ground water levels also indicate that the trees are intercepting and removing the contaminants from the site. It is estimated that within 30 years, contaminants at J-Field may be reduced by up to 85 percent.

Trees grown on phytoremediation sites become multi-taskers when they are harvested and used as fuels for energy production or as biorefinery feedstocks. Fast-growing trees such as poplars, willows and eucalyptus are likely candidates. One example: bioenergy company Vega Biofuels recently announced that its joint venture partner, Agri-Tech Producers, LLC (ATP) has developed a process that reduces biomass feedstock costs, while expanding the availability of nearby forest acreage. Dubbed the Site Remediation Biomass and Bio-Coal Production Process, it uses the phytoremediation powers of the roots of fast-growing trees that have been planted to clean contaminated sites. Vega will harvest the trees and use them as feedstock for its torrefaction process that uses heat to convert wood to "biocoal," a high-energy-density product that can substitute for coal as a boiler fuel.

An article at the web site extension.org enumerates the advantages of poplars as energy feedstocks. They are more desirable for biofuels than many other woody crops because of their fast growth, their ability to produce a significant amount of biomass in a short period of time, and their high cellulose and low lignin contents. Trees in poplar bioenergy farms can be planted at 1,500 trees per acre, which is much closer together than those intended for more traditional uses such as pulp and paper, which range from 34 to 360 trees per acre. This is done to speed the accumulation

of biomass per acre rather than produce large individual trees. Poplar energy farms may contain as few as 700 to as many as 5,700 trees per acre. High-density plantings produce many small stems and more biomass than traditional methods. They are ready to harvest within two or three years.

Despite the apparent promise of schemes to combine phytoremediation with biofuels production, there are few instances of their commercialization or planned commercialization. The Vega Biofuels plan is one; perhaps others will emerge soon.

Trend Indicators from Industry Intelligence Inc.

[Industry Intelligence Inc.](http://www.industryintel.com) has provided market intelligence to more than 600 companies worldwide since it began as Forestweb in 1999. Industry Intelligence delivers a daily report featuring news of the paper and forest products industries. For your subscription visit: <http://www.industryintel.com>

Below is a small sampling of recent Industry Intelligence headlines, chosen to mirror significant trends in and around the paper and forest products industries.

Agenda 2020 Technology Alliance presented with research roadmaps that could help forest products industry achieve its growth and sustainability targets, says group's chair; the work, which was done by six teams, was reviewed at Dec. 9 quarterly meeting

The Agenda 2020 Technology Alliance is an industry-led consortium that promotes development of advanced technologies for the pulp and paper industry. The teams have generated research roadmaps to address key opportunities and challenges for the industry. According to executive director David Turpin, the roadmaps delineate achievable goals and pathways. The group will now develop specific requests for proposals and seek to fund them.

Domtar approves US\$160M paper machine conversion in Ashdown, Arkansas, to fluff pulp line, reducing uncoated freesheet capacity by 364,000 tons/year while increasing fluff pulp output by up to 516,000 tonnes/year; converted unit slated to start up Q3 2016

The Company will also invest in a pulp bale line that will provide flexibility to manufacture paper grade softwood pulp, contingent on market conditions.

Verso has an incentive for its Bucksport, Maine, coated paper mill to be salvaged rather than restarted, as it would be a competitor with its other mills, says head of USW in Maine, noting he expects it to be demolished by new owner American Iron & Metal

Verso is separately pursuing an acquisition of NewPage in a deal that is pending antitrust approval from federal regulators. NewPage in October agreed to sell its Rumford mill to the Canadian company Catalyst Paper, to address concerns that the joint company would control too much of the North American market for coated paper.

Sappi to build pilot-scale plant to make nanocellulose after discovering, in partnership with Edinburgh Napier Univ., process for low-cost, commercially viable production that saves energy, doesn't create as much chemical wastewater as existing techniques

The Edinburgh Napier research team say they have been able to drastically reduce the amount of energy needed to power the process, as well as the need for expensive chemicals.

Study finds paper towels less germey than air dryers

According to the study, airborne germs were 27 times higher around jet air dryers than the air surrounding paper towel dispensers.

Resolute Forest Products to permanently close its Iroquois Falls, Ontario, newsprint mill and one newsprint machine each at its Baie-Comeau and Clermont, Quebec, paper mills, for total reduction of 465,000 tonnes/year, occurring through Jan. 30

This is a result of not only ongoing weakness in the global newsprint business but also fiber availability and costs, transportation challenges, power costs and spruce budworm infestation.

Demand for corrugated, paperboard boxes in US forecast to increase 2.6%/year to US\$39.4B in 2018, driven by heightened demand for value-added box types such as those that feature high-quality printing or are constructed in display-ready form, report finds

Gains will be driven by a rebound in manufacturing output and continued expansion of the overall economy.

China pulp imports rise 11.8% year-over-year in October while inching down 0.5% month-over-month, to 1.540 million tonnes; year-to-date imports increase 7.0%

Imports to China continue to increase year over year. They have surpassed 1 million tonnes in every month since August 2011

Spero Energy receives US\$50,000 grant from Indiana Economic Development partner, following grant from National Science Foundation, for process that converts lignin in wood biomass into cellulose for biofuel production, chemical for flavors, fragrances

(Editor's note: Most chemists would agree that converting lignin to cellulose stretches the limits of credibility.)

Minnesota proposes statewide mountain pine beetle quarantine to limit imports of pine wood with bark from western states with known infestations, plans public meeting on Dec. 3 to gather input on effort to protect state's 370 million pine trees

Climate and forest conditions have caused an unprecedented outbreak of the mountain pine beetle in the western U.S. and Canada over the last decade.

US chlor-alkali production falls to 70% in October from six-year high of 86% in September, says the Chlorine Institute, due to seasonal plant slowdowns, outages and high costs of ethylene, which are also dragging down production of chlorine, caustic soda

Demand for chlorine has declined as ethylene cost has increased. Caustic soda production is linked to chlorine production, so the production decrease is likely to increase caustic soda prices by \$33-50/tonne.

Rottneros showcases its newly developed high-yield pulp called Absorption Express at London Pulp Week; the new grade has twice the absorption capacity and absorption speed, excellent bulk in relation to more expensive pulps it replaces, says company

(Editor's note: Does this signal new competition for US southern pine pulps?)

Kruger's Corner Brook, Newfoundland, newsprint mill sees increased profits from devalued Canadian dollar and some reduced costs due to lower crude oil prices but faces higher ocean freight costs, competitive pressures on newsprint prices in weak market

One analyst estimates that at least 600,000 tonnes/year of production capacity will have to be permanently shut down in 2015 to balance out newsprint supply and demand. He further opined that the hope for increased

exports could get worse, as some emerging economies have advanced toward the digital age more quickly than expected.

With loss of Great Northern Paper mill in Millinocket, Maine, last summer, town expects to reduce spending by up to US\$2.0M next year or raise taxes; belt tightening suggestions involve wide range of cuts, such as in municipal workforce and some services

GNP was the town's largest single taxpayer but experienced a dramatic drop in valuation when it scrapped its papermaking equipment there in June.

Xinghui Paper, a JV of Hokuetsu Kishu Paper, Mitsubishi and Hop Chong Paper, celebrates completion of 300,000 tonnes/year coated boxboard mill in Guangdong Province, China, awards PMT Italia outstanding supplier medal

The new paper machine has a wire width of 4.9 meters and produces duplex white board at a maximum operating speed of 650 m/min.

Appvion replaces BPA in receipt paper with Vitamin C

Appvion has debuted Alpha Free receipt paper, which it says is the first to use vitamin C as a safe alternative to bisphenol A (BPA) on thermal receipt paper.

Print flyers and coupons still popular in US, Canada

A BrandSpark International study finds respondents consider flyers for grocery stores, mass merchants and drug stores to be more valuable than online or email by a significant margin. Consumer packaged good companies distributed 171 billion coupons in the first half of 2014 in the U.S., according to data from NCH Marketing Services. Meanwhile, less than 1% of all consumer packaged goods coupons were digital.

AF&PA Statistics

The American Forest and Paper Association recently issued its October 2014 Printing and Writing Paper Report.

Total shipments decreased 7 percent in October compared to October 2013, with total paper inventories decreasing 7 percent compared to September.

Uncoated free sheet (UFS) paper shipments in October decreased 12 percent compared to October 2013. YTD shipments are down 9 percent in 2014. Imports of UFS

increased 17 percent in September and were up 23 percent year-to-date in 2014.

October coated free sheet (CFS) paper shipments decreased 6 percent compared to 2013. YTD shipments of coated freesheet grades are down 3 percent. Exports of CFS papers were down 4 percent for the year compared to the first nine months of 2013, with imports increasing 2 percent for the same period.

Uncoated mechanical (UM) paper shipments increased 9 percent in October, the ninth consecutive month of year-over-year increases. Year-to-date shipments of UM were up 5 percent compared to 2013.

Coated mechanical (CM) shipments in October were essentially flat relative to October 2013 and are down 4 percent for the year. Exports of CM grades increased 12 percent year-over-year in September and are up 8 percent compared to the first nine months of 2013.

The full report can be purchased by contacting Caroline Nealon, Statistics_Publications@afandpa.org or 202-463-2448.

Paper Quotes

“I’ve got a vendetta to destroy the Net, to make everyone go to the library. I love the organic thing of pen and paper, ink on canvas. I love going down to the library, the feel and smell of books.” – *British actor Joseph Fiennes*

“Paper is no longer a big part of my day. I get 90% of my news online, and when I go to a meeting and want to jot things down, I bring my Tablet PC. It’s fully synchronized with my office machine, so I have all the

files I need. It also has a note-taking piece of software called OneNote, so all my notes are in digital form.” – *Bill Gates*

“People buy pads all the time, because they want to write stuff down. We’re never going to get away from paper, ever. People like writing; that’s why more people are writing more real thank-you notes now - not just to stand out, but because there’s something about pen to paper, about holding something cool in your hands.” – *Author Marcus Buckingham*

“I have no interest in retail; I have no interest in opening a bookstore but I also have no interest in living in a city without a bookstore.” – *Ann Patchett, acclaimed author of “Bel Canto” and “Truth and Beauty,” during an interview for the Nov. 15, 2011 NY Times article, “Novelist Fights the Tide by Opening a Bookstore.”*

“Proofread carefully to see if you any words out.” – *Author unknown*

Statistics Corner: Chinese Exports of Paper and Board

Figure 1, below, summarizes data on Chinese exports of paper and paperboard for the period January 2013 through October 2014. China’s exports of paper and paperboard in October were up 12.5% year-over-year to 540,000 tonnes, bringing the total volume year-to-date to 5.27 million tonnes, up 13.7% from a year ago. ■

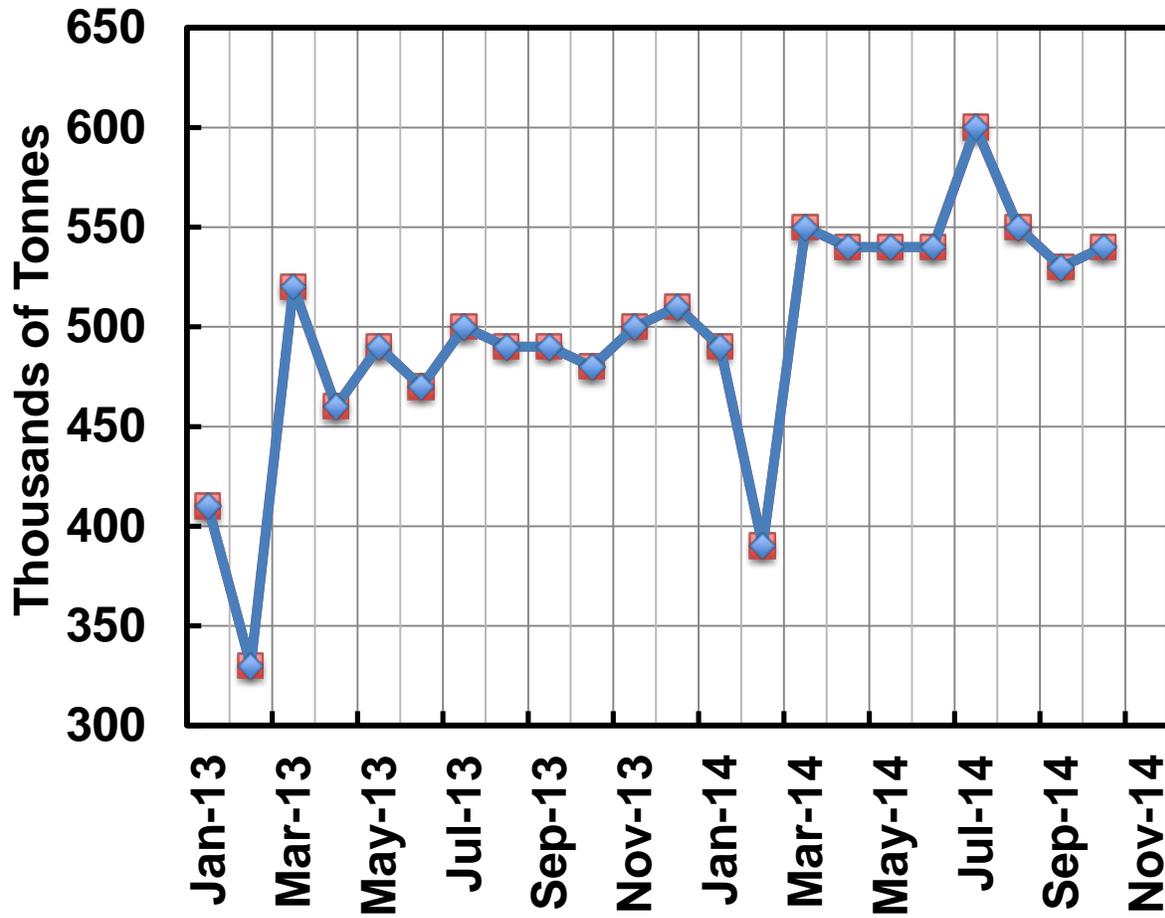


Figure 2. China's Exports of Paper and Paperboard, 2013 –Present (Source: Xinhua News Agency)