The Department of SUSTAINABLE BIOMATERIALS
Volume 8 — Fall Issue 2 | 2013

Sustainable Biomaterials Newsletter

It has been a busy fall in Blacksburg and it's hard to believe that Thanksgiving is only 2 weeks away. This is my favorite time of year since moving from the north more than 20 years ago. In the upper Midwest we have very short falls and even shorter springs. We used to say we had two seasons in upper Michigan, "winter and tough snow-shoeing". Most of the leaves have fallen and the students are busy studying and wondering which bowl game the Hokie's football team will go this year. They will need to win a couple more to play later in the bowl season.

Our students have been helping us with departmental recruiting efforts this fall. Our most effective method of attracting students to our program is to have current students visit with potential students. We have a student ambassador program in the college where students volunteer to work with faculty in these types of efforts. We recently had advisors from the Virginia Community College system visit the college and each department presented their programs to help these individuals better understand the great opportunities in CNRE. Our department continues to grow with over 90 students in the undergraduate program and more than 35 in our graduate program as of October 1. This is due in large part to our recruiting efforts and the growth of our new program in Packaging Science with over 40 students. This issue will highlight our new packaging program and its recent activities. They participated with the department on the drill field on campus in exhibiting the department's educational programming, they held their annual advisory board and networking reception with industry, and some of the students attended Pack-Expo, the largest packaging trade show in North America. All of these events are meant to provide a broader exposure for our students and our program to the careers available in the broad field of Packaging.

Later in the issue you will see how we benefit from the support of our industry partners with their donations that range from lumber for our class projects to books to help teach our students in the packaging science area. We thank all of the companies and organizations that help support our program with their donations of equipment, materials or scholarships. Dr. Quesada and his graduate student Jeremy Withers have been working with our Natural Resource Extension agents to demonstrate the biomass generator that we have in the department. The Wood Enterprise Institute (WEI) will be manufacturing a decorative wood cutting board this year as their product and will be taking orders soon, so please help support this innovative education experience for our students. Finally, our department's extension faculty have been busy with a number of efforts this fall. If you have any questions regarding this newsletter or the department, please contact me at 540-231-7679 or rsmith4@vt.edu.

Sincerely,
Bob Smith
Department Head

VT-Packaging in Gobblerfest 2013

by Catherine Jucha

On September 6, Virginia Tech's Packaging student club joined the 2013 Gobblerfest to promote student activities and the VT-packaging program. With strong financial support from the SBIO department, Catherine Jucha, who was hired as a student worker under the guidance of Dr. Young Kim and Dr. Laszlo Horvath and is currently considering a transfer to the packaging program from another college, primarily organized this event along with 10 other active VT-Packaging student club members. Through this event, she and club members interacted with the entire Virginia Tech family and experienced many positive things. It was also a great chance for the students to be united as well as to learn teamwork. As a student worker and member of the student club, Catherine shared what she felt during this event below (by Dr. Kim and Dr. Horvath);

"This year's Gobblerfest was the perfect opportunity for the enthusiasm of students in the Packaging Science program to transmit to their fellow undergraduates in various other disciplines. Gobblerfest, an annual festival held on the Virginia Tech Drillfield, allows all students interested in getting involved in the numerous academic programs and clubs that the university has to offer. At Gobblerfest, the Packaging Science table this year was extremely successful in introducing undergraduate students to the many faces of the program. I am one of the students that was introduced and immediately intrigued with the Packaging Science program in Sustainable Biomaterials.

As a sophomore in the College of Architecture and Urban Studies, I came to the realization that I really had a passion for packaging and that it was time to transfer into the program! My experience at the packaging table was truly so enjoyable and exciting! I was able to interact with other students already in the program along with some in university studies as well!

Hundreds of students visited the table and were able to learn and hear what the program has to offer while sipping on some ice cold Gatorade provided by the packaging table. Also, visiting students were even able to be introduced and interact with the packaging professors. A free furniture raffle was offered as well. Overall, the Packaging table at Gobblerfest gave Virginia Tech students the rare opportunity to get a glimpse into the inner workings and aspects of packaging that make it a $420 billion industry. "

All Powers Biomass Power Plant Demonstrated at 2013 Bus Tours at The Reynolds Homesteadt

Jeremy Withers, a BS/MS student at the Department of Sustainable Biomaterials, and assistant professor Henry Quesada traveled in October 15 to the Reynolds Homestead in Critz, VA to demonstrate the Deparment's biomass power plant at the 37th Annual Fall Forestry and Wildlife Field Tours.

SBIO student Jeremy Withers explains the main aspects of the All Powers biomass power plant during the Bus Tours at the Reynolds Homestead

The power plant is portable and can be fit into a 8' truck bed. The unit is capable of producing up to 10,000 watts per hour at a consumption rate of 12 kilograms of wood chips per hour. In this occasion a mix of hardwood chips was used as the feedstock. The basic operating aspects, the science behind, and the technology used to operate the unit were explained to the participants as the unit was running and generating electricity.

If you any questions or want to learn more about the All Power biomass power plant please contact Dr. Henry Quesada at quesada@vt.edu.

Local Industry Supports VT Teaching Efforts

Turman Lumber Company again supported the teaching efforts in the Department of Sustainable Biomaterials by allowing student to tour and by supplying lumber for a class project. The tour and lumber were used in SBIO 3436 Wood Products Manufacturing. Truman Bolt, manager of the Turman facility in Radford, graciously allowed students to tour the Radford sawmill for one laboratory period. The students took measurements of lumber thickness and machine operating effectiveness which were then used to evaluate the mill's performance. Truman also supplied the lumber used in the class drying lab, where the students were responsible for drying 800 board feet of 5/4 yellow poplar in a steam heated dry kiln. Thanks to Truman Bolt and all the folks at Turman Lumber for their support of our undergraduate teaching efforts. These efforts help students to engage in taking concepts taught in class and applying them to real production situations.

2013 Wood products manufacturing class says, "Thank you," to Turman Lumber.

Students Benefit from Industry and Trade Association Support

Students in Dr. Bush's *Principles of Packaging* course (SBIO 2104) during fall semester 2013 are benefiting from support provided by companies and trade associations. Carded Graphics of Stanton, Virginia donated a generous amount of paperboard to use for the course project. The American Forest and Paper Association provided copies of the

Paperboard Packaging Council book, *Ideas and Innovation: A handbook for designers, converters, and buyers of paperboard packaging*. The Glass Packaging Institute, the Can Manufacturers Institute, the Sustainable Packaging Coalition, and the International Corrugated Packaging Foundation arranged speakers for the course. Mr. Larry Wolfe, Sr. Project Director with the Stephen Gould Corporation spoke with the class about the packaging design process. Mr. Wolfe used as examples the packaging systems his team developed for McCormick and Company, Inc. (*Recipe Inspirations*) and Sears, Roebuck & Company (Craftsman tool packaging). The Department of Sustainable Biomaterials thanks each of these organizations and individuals for supporting student learning.

Quesada and Smith Visit Vietnam to Understand Current Markets for American Hardwoods

Drs. Smith and Quesada along with students of the Vietnam University of Finance during the VietnamWood Tradeshow

Recently, assistant professor Henry Quesada and department Head Robert Smith, both at the Department of Sustainable Biomaterials, traveled to Vietnam to interview importers of American hardwoods during the 2013 VietnamWood tradeshow. The trip is part of an international marketing project that has as a goal to identify factors that impact the import of American hardwoods in Western Europe, China, and Vietnam markets.

According to statistics from the Vietnamese government, more than 300,000 people work in the furniture sector in almost 3,000 furniture industries. The furniture industry in Vietnam continues to grow (16% from 2007 to 2012) due to different factors such as: lower cost labor, excellent craft skills, and government incentives to attract foreign investments from countries such as Taiwan, China, and United States. Interesting to mention is that most of the production of furniture is for the export market.

Besides interviewing importers of hardwoods during the tradeshow, Quesada and Smith also had the opportunity to visit a furniture manufacturer and a molding facility a few miles outside Ho Chi Ming City. The furniture manufacturer imports radiate pine from Chile and New Zealand and yellow poplar from United States and they require about 50 containers per month. In this facility, more than 3,000 employees produce bedroom furniture for the European and the American market.

Appalachian companies such as American Hardwood Industries, Turman Group, and Baillie among others already have developed a market for hardwood products in Vietnam. Species such as red oak, white oak, ash, and yellow poplar are the most sought in this market and they are imported mostly in the form of lumber rather than logs.

If you any questions abour specific opportunities for your products in this market please contact Dr. Henry Quesada at quesada@vt.edu.

Jonghun Park Receives First Place of the 2013 J. Richard Troll Memorial Scholarship

by Laszlo Horvath

The annual meeting of the Alliance of Independent Corrugated Converters (AICC) is one of the most important events for professionals working in the corrugated packaging industry. This year the event focused on communication and leadership in the packaging industry. Presenters from companies such as ZAPPOS presented about the importance of communication in the 21st century and highlighted the differences between the sales strategies employed for the different generations of customers. Despite the great distance, eleven students from Virginia Tech's packaging program with the supervision of Laszlo Horvath and Young Teck Kim participated in the meeting. The highlight of the event was the scholarship award recognition ceremony where Jonghun Park (Ph.D) received first place of the 2013 J. Richard Troll Memorial Scholarship.

Jonghun Park (Ph.D.) accepts the first place recognition of the 2013 J. Richard Troll Memorial Scholarship.

Pack Expo 2013 – Las Vegas

by Laszlo Horvath & Young Teck Kim

Pack Expo is one of the biggest events in the packaging industry bringing broad range of suppliers, manufacturers, and customers of various packaging solutions together. Two faculty, Dr. Young Teck Kim and Dr. Laszlo Horvath are represented the packaging program at Virginia Tech during the expo.

Zack Shiner, Michael Deck, Andrew Corbin, Young Teck Kim, and Laszlo Horvath representing Virginia Tech at Pack Expo 2013.

The expo provided a great networking opportunity with the relevant packaging industry and also provided a platform to learn about the latest technology. Talking with the companies, it became apparent that the packaging industry is moving toward sustainability and significantly advanced in the area of packaging automation. Despite the great distance and the significant expense, eleven packaging undergraduate students decided to participate in the Expo to broaden their knowledge in the packaging field and to expand their professional network. This year our students participated in the Pack Solution Challenge where they needed to design a solution to a real life problem of one of the packaging companies. The students were competing against students of the other major packaging schools.

Students participated in the annual meeting of the AICC where they learned about how customer relations influences the bottom line of companies. Students from left to right: Matt Baker, Michael Deck, Andrew Corbin, Jacob Modzelewski, Jonghun Park, Matthew Shiller, Margaret Mabutas, Zack Shiner, Madeline Alden, Alyssa Lopez and Cyrus Adibpour.

Major packaging conference organized by the Alliance of Independent Corrugated Converters (AICC) has been organized during the same days as the 2013 Pack Expo; thus, the students had an opportunity to participate in both. The event provided a great opportunity for Virginia Tech's students to meet with the leaders of the corrugated industry and to learn about the latest trends in the industry. In addition to the great professional experience, our students also had some time to enjoy what Las Vegas could offer.

2013 Advisory Board Meeting and Networking Reception of the VT Packaging Program

by Laszlo Horvath

Interns in the Sustainable Packaging Designer Trainee program presenting the results of their summer projects. Students from left to right: Michael Fortunato (Junior), Page Clayton (Junior), Megan Stallings (Freshman), Richard Good (Sophomore), and Cyrus Adibpour (Junior).

In the last 20 years, the advisory board meetings of Center for Packaging and Unit Load Design (CPULD) has been a great place for industry professionals to talk about recent issues faced by the pallet and packaging industry. With the expanded focus on total packaging and sustainable packaging materials, the Advisory Board has been extended to incorporate companies from the primary packaging and packaging design sector. Overall, 30 major packaging companies such as ESKO, Newell Rubber Maid, FEMSA, Klockner, PCA, and Corrugated Containers traveled a great distance to attend the event on September 10, 2103. At the beginning of the event Robert Bush provided an overview of the status of the new B.S. degree in Packaging Systems and Design followed by Laszlo Horvath and Young Teck Kim who provided an overview of the activities of the Center for Packaging and Unit Load Design and student clubs of the packaging program, respectively. The highlight of the event was the first group of students participating in the Sustainable Packaging Designer Trainee program, Megan Stallings (Freshman), Michael Fortunato (Junior), Page Clayton (Junior), Cyrus Adibpour (Junior), and Richard Good (Sophomore), who took the stage and presented their summer projects to the attendees. The students did a great job outlining the importance of their projects and how the obtained skills will help further their education. The students received positive feedback and a lot of excitement from the members and they also have featured in the October issue of the Pallet Enterprise trade magazine. More information on the students participating in the training program can be found at unitload.vt.edu/education/interns.

Recognition of the generous donation of ESKO and Gerber Technologies at the Networking Reception of the Packaging Program at Virginia Tech.

At the end of the meeting, a networking reception provided an opportunity for the attendees to interact with the students and to build life long relationships with each other. The highlight of the reception was been the recognition of the generous software donation by ESKO and the equipment donation of Gerber Technologies.

Goodell Delivers Talk at Royal Academy in London

Professor Barry Goodell delivered an invited talk at the Royal Academy in London, England at a Conference on: Lignocellulose Degradation Mechanisms from Across the Tree of Life. The meetings were held at the Linnaean Society of London Headquarters within the Royal Academy. Goodell's talk was on: "New anatomical findings on the structure of wood, and the non-enzymatic deconstruction system of brown rot fungi" with co-authors: Daniel Maschek, Valdeir Arantes, Jody Jellison, Mark Lessard, Holger Militz and Yuhui Qian

Dr. Barry Goodell, speaking with Dr. Gervais Sawyer, editor of the International Wood Products Journal in the Library Room of the Linnaean Society of London.

International Research Group on Wood Protection Holds 44th Annual Convention in Stockholm, Sweden

Participants at the IRG-WP meetings attending a banquet at the Vasa Museum in Stockholm Sweden. The Vasa ship sank off of Stockholm in 1682 and was recovered 52 years ago for conservation.

In June, Professor Barry Goodell attended the 44th Annual Convention of the International Research Group on Wood Protection (IRG-WP) in Stockholm, Sweden. Goodell presented a talk with Dr. Fangli Sun and others from Zhejiang Agric. and Forestry University in China on the "Influence of Selected Additives and Organic Fungicides for Control of Bamboo Mold Fungi". He also presented a paper with Dr. Jeffrey Morrell of Oregon State University on: "Predicting the Rate of Decay, and the Potential for Misinterpretation of Proper Scientific Method". The later paper was one of two papers presented for discussion of service life prediction issues, and how data being generated by IRG members and other respected scientist was being misused by untrained persons to distort facts on how decay and degradation actually occur in structures. Goodell also participated in paper coauthored by Jody Jellison, Barry Goodell, Gry Alfredsen (Norway), Dan Eastwood (Wales), Geoffrey Daniel (Sweden), Simon Cragg (England), Ken Grace (US) entitled: "What molecular biology can tell us about the biodegradation of lignocellulose: the utilization of molecular techniques for the detection, identification and enhanced understanding of wood degrading organisms."

Virginia Cooperative Extension
Virginia Tech
Virginia State University
www.ext.vt.edu

SBIO Extension

Fall 2013
Volume 1,
Number 2

Extension Highlights

The wood products industry in Virginia is a critical contributor to the economy of the state, an industry represented by more than 1,000 primary and secondary industries and over $25 billion in economic impact.

The Department of Sustainable Biomaterials (SBIO) at Virginia Tech is one of the leading U.S. academic programs in the field of renewable materials with a focus on cellulosic materials such as wood products. Besides research and teaching efforts, SBIO has an important role in dissemination of new knowledge in the area of renewable materials through SBIO's three extension specialists.

Specialists

Brian Bond
bbond@vt.edu
Wood Processing

Urs Buehlmann
ubuehlm@vt.edu
Secondary Industry Manufacturing

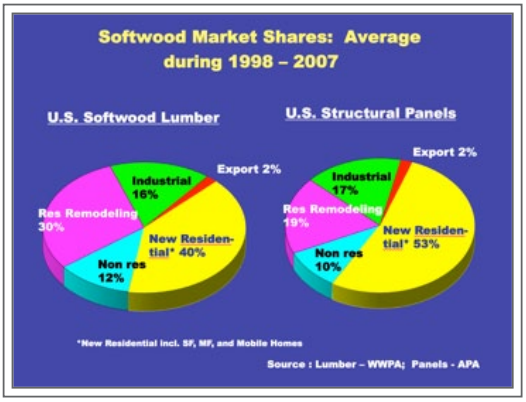
Henry Quesada
quesada@vt.edu
Continuous Improvement

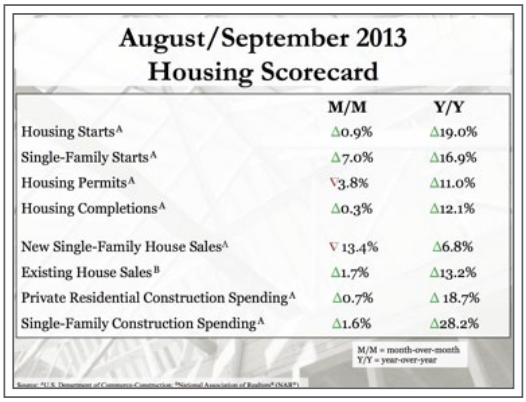
SBIO Extension Faculty Participate in Jr. Hokie Showcase

Dr's Brian Bond, Henry Quesada, John Bouldin and Urs Buelhmann put together a Wood Magic event for this years Junior Hokie Showcase sponsored by Mongtomery County 4-H. The event was held at the Alphin Stuart Arena on Virginia Tech's campus. Over 150 children and teachers participated in the "rock stars" event that demonstrated the differences in bending strength for different wood species. SBIO faculty and graduate students assisted by providing the event every afternoon from October 14-18th.

Housing market updates

The United States wood industry's fortunes depend heavily on the well-being of the United States housing market as more than 50 percent of the industry's business is tied directly to housing. Indeed, the past six years were challenging for the housing market as well as for the wood products industry due to the economic and financial crisis. By now, the U.S. housing market has improved over the past few months, the outlook for the United States economy and the housing market





August/September 2013
Housing Scorecard

	M/M	Y/Y
Housing Starts[A]	Δ0.9%	Δ19.0%
Single-Family Starts[A]	Δ7.0%	Δ16.9%
Housing Permits[A]	∇3.8%	Δ11.0%
Housing Completions[A]	Δ0.3%	Δ12.1%
New Single-Family House Sales[A]	∇13.4%	Δ6.8%
Existing House Sales[B]	Δ1.7%	Δ13.2%
Private Residential Construction Spending[A]	Δ0.7%	Δ 18.7%
Single-Family Construction Spending[A]	Δ1.6%	Δ28.2%

M/M = month-over-month
Y/Y = year-over-year

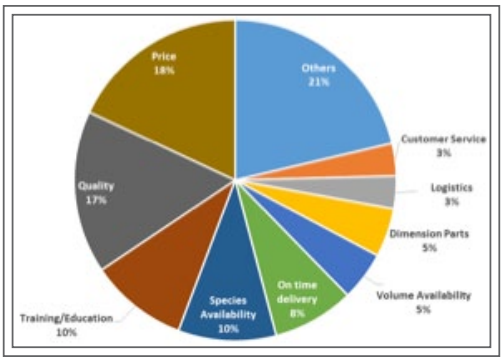
in particular is mostly positive. Thus, the fortunes of the United States wood industry are positive, with the constraints being the general economic conditions and the influence of rising interest rates on housing market.

Urs Buehlmann and his collaborators at the US Forest Service, Al Schuler and Delton Alderman, publish monthly updates on the U.S. housing market to provide our industry partners with timely information to gauge market opportunities and to allow for planning. These housing reports, which are disseminated free of charge via email are intended to provide industry participants with a wide range of data to allow for independent assessment of the situation and future markets.

All past housing reports can be viewed at: woodproducts.sbio.vt.edu/housing-report/. To be added to the mailing list for the free monthly housing reports email to buehlmann@gmail.com.

Increasing value of products and services for American hardwood companies

Recent marketing research conducted by Henry Quesada, SBIO extension specialist, identified factors that American hardwood producers need to improve to remain competitive in international markets. Buyers from Germany, China, and Vietnam indicated that the most important factors to improve are price, quality, availability, and on time delivery. More information on this marketing project can be found at www.cfpb.vt.edu



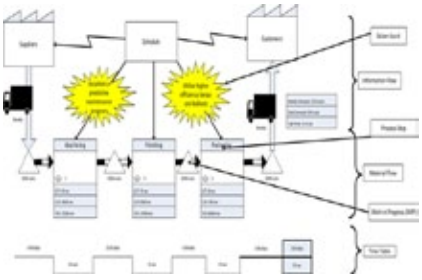
Upcoming Events

The Department of Sustainable Biomaterials (SBIO) at Virginia Tech and conjunction with the Virginia Forest Products Association (VFPA) and Virginia Cooperative Extension (VCE) is offering an educational session on **May 15, 2014** as part of the 2014 Richmond Expo organized by VFPA. The educational session is divided in two tracks. The morning track will focus on drying operations and the afternoon track will focus on financial management principles for forest products industries. For more details please visit the web page http://sim.sbio.vt.edu/?p=1961

WORKSHOP: Energy Reductions Using Lean Thinking

What is Lean Thinking?

Lean Thinking is reducing waste by focusing on value-added steps within the process; value is defined through the eyes of the customer. “Lean thinking is doing more with Less” -James Womack



Value and Energy Stream Map

Lean and Energy

Process improvement methodologies are being applied all across the industry in order to reduce manufacturing cost. With electrical energy prices rising, electricity is a large component of these costs associated with a manufacturing process. Incorporating common best energy management practices along with process improvements will result in energy efficiency and higher production.

Installed Energy Management System

Goal

The purpose of this workshop is to inspire new visions and strategies which address the most pressing energy challenges for contemporary society; it will create new ideas for usage of Lean Principles in reducing energy use and costs. It will also promote collaboration between scholars working across disciplines on Lean Thinking and Energy.

Tentative Agenda

9:00 am - 4:30 pm

- Welcome and Overview
- Current and Future Scenario of Energy in Virginia
- Lean Thinking Principles
- *Break*
- Energy Audits Using Lean Thinking
- Energy Management Systems
- *Lunch*
- Industry Case Study
- Closing Comments and Questions
- Adjourn

Relevant to:

Plant Managers, Quality Engineers, Process Engineers, Procurement Managers, Supplier Chain Managers, Purchasing Managers, Plant Engineers, Energy Managers, Energy and Environment Engineers and Medium Enterprise Manager

Date:
November 20, 2013

Location:
Wood Education Resource Center
301 Hardwood Lane
Princeton, WV 24740
(304)-487-1510

Cost:
$50 Includes coffee breaks, lunch and materials

Registration:
Please Contact:
Dr. Henry Quesada
Email: quesada@vt.edu
Phone: 540-231-0978