

Professional Status and Activity

Honors and Awards

- 2018 Henry Mason Lutes Award for Excellence in Engineering Education
- 2018 Outstanding Teaching Award – Department of Chemical and Materials Engineering, Paducah Campus
- 2017 University of Kentucky Provost Outstanding Teaching Award
- 2017 Outstanding Teaching Award – Department of Chemical and Materials Engineering, Paducah Campus
- 2016 Fulbright Specialist Roster Member
- 2015 Finalist, Elsevier Green and Sustainable Chemistry Award
- 2015 College of Engineering Dean's Award for Excellence in Service
- 2013 Outstanding Teaching Award – Department of Chemical and Materials Engineering, Paducah Campus
- 2013 AIChE Sustainable Engineering Forum Education Award (Inaugural Recipient)

Appointments

Visiting Associate Professor

Dept. of Agricultural and Biosystems Engineering, Makerere University, Kampala, Uganda, 2017 – Present

PJC Board of Trustees Engineering Professor

College of Engineering, University of Kentucky, 2016 - Present

Leadership Positions and Committee Memberships

National Offices and Committee Memberships Held

- 2017 – Present Chair for Programming, AIChE Environmental Division
- 2016 – Present Chair, AIChE SEF Awards Advisory Committee
- 2014 – 2016 Vice-Chair for Programming, AIChE Environmental Division
- 2013 – 2015 Chair, AIChE Sustainable Engineering Forum
- 2011 – 2013 Vice-Chair, AIChE Sustainable Engineering Forum
- 2011 – Present Chair, AIChE Youth Council on Sustainable Science and Technology (YCOSST)
- 2011 – 2015 *Ex Officio* Member, AIChE Institute for Sustainability (IfS) Managing Board
- 2011 – 2015 *Ex Officio* Member, AIChE Center for Energy Initiatives Managing Board
- 2009 – 2011 Chair, Education Committee – AIChE Sustainable Engineering Forum
- 2008 – 2013 Member, Awards Committee – AIChE Sustainable Engineering Forum

Journal Editorial Board Memberships

- 2015 – Present Editorial Advisory Board for Journal of Env. Prog. and Sust. Energy
- 2014 – Present Review Editorial Board for Journal of Process and Energy Systems Engineering

National and International Conference Organizing Committees

- 2016 International Advisory Committee, 4th International Symposium on Sustainable Chemical Product and Process Engineering, Nanjing, China.
- 2015 Organizing Committee Co-Chair, 5th International Forum on Sustainable Manufacturing, Lexington, KY
- 2014 Organizing Committee Co-Chair, 4th International Forum on Sustainable Manufacturing, Lexington, KY
- 2014 International Programming Committee, Foundations of Computer Aided Process Design 2014, Cle Elum, Washington.
- 2013 International Advisory Committee, 3rd International Symposium on Sustainable Chemical Product and Process Engineering, Dalian, China.
- 2013 Organizing Committee Co-Chair, 3rd International Forum on Sustainable Manufacturing, Lexington, KY
- 2013 Organizing Committee, Sustainability in (Bio)Pharmaceuticals Conference, Cincinnati, OH

2008 Organizing Committee, 2008 Evonik Meets Science Conference, Washington, D.C.

Working Group and Forum Memberships

2011 – Present Member, Engineer’s Forum on Sustainability

2011 – 2013 Member, International Energy Agency – Annex IX: Energy Efficient Separations

Professional Development Workshops Led

2013 “Sustainability Overview, Assessment and Metrics for Practicing Engineers”, Paducah, KY

2013 “Engineering Education for a Sustainable Future”, ASEE Annual Meeting, Atlanta, GA

2011 “Sustainability Overview, Assessment and Metrics for Process Engineers”, AIChE Annual Meeting, Minneapolis, MN

National and International Conference Programming

2018 Poster Session Chair, 7th Inter. Cong. On Sust. Sci. and Eng., Cincinnati, OH

2016 Poster Session Chair, 4th Inter. Conf. on Sust. Chemical Prod. and Proc. Eng., Nanjing, China

2015 Chair, Session 132 SEF Plenary, AIChE Annual Meeting, Salt Lake City, UT

2014 Chair, Session 124 SEF Plenary, AIChE Annual Meeting, Atlanta, GA

2014 Poster Session Chair, Foundations of Computer Aided Process Design, Cle Elem, WA

2013 Co-Chair, Plenary Session: 3rd Annual World Congress on Sust. Eng., San Francisco, CA

2013 Co-Chair, Session 118 SEF Plenary, AIChE Annual Meeting, San Francisco, CA

2013 Chair, Student Poster Session, 3rd Inter. Conf. on Sust. Chemical Prod. and Proc. Eng., Dalian, China

2013 Chair, Session 2, 3rd Inter. Conf. on Sust. Chemical Prod. and Proc. Eng., Dalian, China

2012 Chair, Session 23A02 Challenges in Incomp. Sust. in Interdisciplinary Prog., AIChE Annual Meeting, Pittsburgh, PA

2012 Co-Chair, Plenary Session: 2nd Annual World Congress on Sust. Eng., Pittsburgh, PA

2012 Co-Chair, Session 23A00 Env. Health, Safety and Sust., AIChE Annual Meeting, Pittsburgh, PA

2012 Co-Chair, Session 10A05 Synth. and Des. for Water Syst., AIChE Annual Meeting, Pittsburgh, PA

2011 Chair, Student Poster Session, 2nd Intl. Cong. on Sust. Science and Eng., Tucson, Arizona

2010 Chair, Student Poster Session, 2nd Intl. Symp. on Sust. Chem. Prod. and Proc. Eng., Hangzhou, China

2011 Co-Chair, Plenary Session: 1st Annual World Congress on Sust. Eng., Minneapolis, MN

2011 Chair, Session 519 Design and Operation for Sust., AIChE Annual Meeting, Minneapolis, MN

2011 Chair, Poster Session, 2011 Intl. Congress on Sustainability Science and Engineering, Tucson, AZ

2010 Chair, Session 23A04 Design for Sustainability, AIChE Annual Meeting, Salt Lake City, UT.

2010 Co-Chair, Session 17009 Biorefinery – Sust. Energy and Env. Issues, AIChE Annual Meeting, Salt Lake City, UT.

2010 Chair, Student Poster Session, 2nd Intl. Symp. on Sust. Chem. Prod. and Proc. Eng., Hangzhou, China

2009 Co-Chair, Session 04011 Teaching Design Outside the Capstone Course, AIChE Annual Meeting, Nashville, TN

2009 Co-Chair, Session 23A00 Design for Sustainability, AIChE Annual Meeting, Nashville, TN

Invited Presentations and Seminars

1. **J. Seay** (2017): “Turning Waste Plastic into Renewable Fuel Around the Globe”, *Mobile-Pascagoula AIChE Local Section Meeting*, Mobile, Alabama.

2. **J. Seay** (2016): “In Silico Modeling and Simulation of Sustainable Biomass Conversion to Acetone-Butanol-Ethanol via Batch Fermentation”, *Makerere University Seminar Series*, Kampala, Uganda.

3. **J. Seay** (2016): “Global Service Learning at UK: Waste to Fuel in India”, Paducah Rotary Club Meeting, Paducah, KY.

4. Darkwah, K, **J. Seay** and B. Knutson (2015): “Dynamic Modeling and Simulation of an on-Farm Bioconversion of Lignocellulosic Biomass into Acetone-Butanol-Ethanol (ABE)”, Sustainable Biorefineries Plenary, *AIChE Annual Meeting*, Salt Lake City, Utah.

5. **J. Seay** (2014): “Global Service Learning Partnership: from Paducah to sub-Saharan Africa”, Paducah Rotary Club Meeting, Paducah, KY.
6. **J. Seay** (2014): “Development of a Sustainable Low Cost Process for Biodiesel Production in Sub-Saharan Africa”, *West Kentucky Community and Technical College Science Seminar*, Paducah, KY
7. **J. Seay** and S. Sukumara (2013): “*Integrated Modeling for Region-Specific Biorefining*”, Invited presentation at the 3rd *International Forum on Sustainable Manufacturing*, Lexington, KY.
8. **J. Seay** (2013): “Education and Credentials in Sustainability”, Invited presentation at the 3rd *International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
9. D. Schuster and **J. Seay** (2013): “Professional Societies and the Water-Energy Nexus”, Invited Presentation at the 3rd *International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
10. **J. Seay** (2011): “Sustainable Engineering Forum Educational Activities”, Invited Presentation to the *Engineers Forum on Sustainability Meeting*, Washington, DC.
11. **J. Seay** and F. Badurdeen (2010): “Multidisciplinary Technoeconomic Modeling for Evaluation of Regional Integrated Biorefining Potential”, Invited presentation to the EPA National Risk Management Research Laboratory, Cincinnati, Ohio.
12. **Seay, J.** and M. Eden (2008): “Industry – Academia Partnerships A Joint Research Project between Auburn University and Evonik Industries”, *2008 Evonik Meets Science North America Conference*, Washington, D.C.

National and International Conference Programming

13. **J. Seay** (2017): “Turning Waste Plastic into Renewable Fuel Around the Globe”, *Mobile-Pascagoula AIChE Local Section Meeting*, Mobile, Alabama.
14. **J. Seay** (2016): “In Silico Modeling and Simulation of Sustainable Biomass Conversion to Acetone-Butanol-Ethanol via Batch Fermentation”, *Makerere University Seminar Series*, Kampala, Uganda.
15. **J. Seay** (2016): “Global Service Learning at UK: Waste to Fuel in India”, Paducah Rotary Club Meeting, Paducah, KY.
16. Darkwah, K, **J. Seay** and B. Knutson (2015): “Dynamic Modeling and Simulation of an on-Farm Bioconversion of Lignocellulosic Biomass into Acetone-Butanol-Ethanol (ABE)”, Sustainable Biorefineries Plenary, *AIChE Annual Meeting*, Salt Lake City, Utah.
17. **J. Seay** (2014): “Global Service Learning Partnership: from Paducah to sub-Saharan Africa”, Paducah Rotary Club Meeting, Paducah, KY.
18. **J. Seay** (2014): “Development of a Sustainable Low Cost Process for Biodiesel Production in Sub-Saharan Africa”, *West Kentucky Community and Technical College Science Seminar*, Paducah, KY
19. **J. Seay** and S. Sukumara (2013): “*Integrated Modeling for Region-Specific Biorefining*”, Invited presentation at the 3rd *International Forum on Sustainable Manufacturing*, Lexington, KY.
20. **J. Seay** (2013): “Education and Credentials in Sustainability”, Invited presentation at the 3rd *International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
21. D. Schuster and **J. Seay** (2013): “Professional Societies and the Water-Energy Nexus”, Invited Presentation at the 3rd *International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
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23. **J. Seay** and F. Badurdeen (2010): “Multidisciplinary Technoeconomic Modeling for Evaluation of Regional Integrated Biorefining Potential”, Invited presentation to the EPA National Risk Management Research Laboratory, Cincinnati, Ohio.
24. **Seay, J.** and M. Eden (2008): “Industry – Academia Partnerships A Joint Research Project between Auburn University and Evonik Industries”, *2008 Evonik Meets Science North America Conference*, Washington, D.C.

Professional Development Courses Taught

- 2013 “Sustainability Overview, Assessment and Metrics for Practicing Engineers”, Paducah, KY
 2013 “Engineering Education for a Sustainable Future”, ASEE Annual Meeting, Atlanta, GA
 2011 “Sustainability Overview, Assessment and Metrics for Process Engineers”, AIChE Annual Meeting, Minneapolis, MN

Awards for Mentored Students

1. **1st Place Student Poster Award**, C. Joshi and J. Seay (2018): “Novel Approaches to Waste Plastic Management in Developing Countries”, *7th International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
2. **1st Place People’s Choice Rapid Fire Poster Presentation Award**, C. Joshi and J. Seay (2018): “Novel Approaches to Waste Plastic Management in Developing Countries”, *7th International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
3. **2nd Place Student Poster Award**, S. Browning and J. Seay (2018): “A Sustainable Approach for Green Pesticide Production in Kenya from the *Croton Megalocarpus* Trees”, *7th International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
4. **3rd Place People’s Choice Rapid Fire Poster Presentation Award** S. Browning and J. Seay (2018): “A Sustainable Approach for Green Pesticide Production in Kenya from the *Croton Megalocarpus* Trees”, *7th International Congress on Sustainability Science and Engineering*, Cincinnati, OH.
5. **3rd Place Award for Undergraduate Research – Environmental I**, S. Browning and J. Seay (2017): “A Sustainable Approach for Green Pesticide Production in Kenya from *Croton Megalocarpus* Trees”, *AIChE Annual Student Conference*, Minneapolis, Minnesota.
6. **SEF Student Paper Award**, Joshi, C. and J. Seay (2016): “An Appropriate Technology Based Solution to Convert Waste Plastic into Fuel Oil in Underdeveloped Regions”, *Journal of Sustainable Development*, Vol. 9, No. 4.
7. **Session Best Paper Award**, Darkwah, K. J. Seay and B. Knutson (2016): “Incorporating Unsteady-State Fermentation Models in Aspen Plus: Fed-Batch and *in Situ* Gas Stripping Simulation and Analyses”, *AIChE Annual Meeting*, San Francisco, CA.
8. **Session Best Paper Award**, Joshi, C., S. Willett, S. Doucet, S. Browning, L. Moffatt, J. Higgins and J. Seay (2016): “A Green Chemistry Approach for Producing Non-Synthetic Pesticide in Under-Developed Regions”, *AIChE Annual Meeting*, San Francisco, CA.
9. **2nd Place Poster Award in Sustainability**, Joshi, C., A. Rankouhi, Y. Huang and J. Seay (2016): “Process Design, Modification, and Sustainability Assessment of Coal and Biomass Co-Fired Plants for Generation of Transportation Fuel: A Case Study in Kentucky” *AIChE Annual Meeting – SEF Poster Session*, San Francisco, CA.
10. **Honorable Mention Award in Sustainability**, Darkwah, K., B. Knutson and J. Seay (2016): “Multi-Objective Optimization of Integrated Aspen Plus Unsteady-State Batch and Fed-Batch Fermentation and *in Situ* Gas Stripping Simulations” *AIChE Annual Meeting – SEF Poster Session*, San Francisco, CA.
11. **Rapid Fire Poster Session 1st Place Award**, Joshi, C. and J. Seay (2016): “An Appropriate Technology Solution for Addressing the Problem of Global Municipal Waste Plastic Accumulation”, *5th International Congress on Sustainability Science and Engineering*, Suzhou, China.
12. **1st Place Research Award**, Joshi, C. and J. Seay (2016): “An Appropriate Technology Solution for Addressing the Problem of Global Municipal Waste Plastic Accumulation”, *5th International Congress on Sustainability Science and Engineering*, Suzhou, China.
13. **Outstanding Oral Presentation Award**, Joshi, C. and J. Seay (2016): “Developing a Sustainable Appropriate Technology Based Solution to Convert Municipal Solid Waste Derived Plastic into Fuel Oil”, *4th International Symposium on Sustainable Chemical Product and Process Engineering*, Nanjing, China.
14. **Outstanding Poster Presentation Award**, Willett, S. and J. Seay (2016): “A Green Chemistry Approach for Producing Non-Synthetic Pesticide in Under-Developed Regions”, *4th International Symposium on Sustainable Chemical Product and Process Engineering*, Nanjing, China.

15. **1st Place Award for Undergraduate Research – Sustainability**, Joshi, C. and J. Seay (2015): “An Appropriate Technology Based, Sustainable Solution for Converting Waste Plastic to Fuel Oil in Rural India”, *AICHE Annual Student Conference*, Salt Lake City, Utah.
16. **1st Place Research Award in Sustainability**, Joshi, C. and J. Seay (2015): “An Appropriate Technology Based Multifunctional Processor for Sustainable Production of Green Chemistry Based Products”, *AICHE Annual Meeting – SEF Poster Session*, Salt Lake City, Utah.
17. **3rd Place Research Award in Sustainability**, Darkwah, K., B. Knutson and J. Seay (2015): “A Multi-disciplinary Framework Decision Support Tool for Assessing the Economic Viability of an on-Farm Bioconversion of Lignocellulosic Biomass into Acetone-Butanol-Ethanol (ABE)”, *AICHE Annual Meeting – SEF Poster Session*, Salt Lake City, Utah.
18. **1st Place Research Award**, Joshi, C. and J. Seay (2015): “Turning Trash into Fuel in Rural India”, *5th International Forum on Sustainable Manufacturing*, Lexington, KY.
19. **2nd Place Research Award**, Darkwah, K. and J. Seay (2015): “A Multidisciplinary Framework Decision Support Tool for Assessing the Economic Viability of an On-farm Bioconversion of Lignocellulosic Biomass into Acetone-Butanol-Ethanol (ABE) as Sustainable Liquid Biofuels – Dynamic Process Simulation”, *5th International Forum on Sustainable Manufacturing*, Lexington, KY.
20. **2nd Place Research Award (tie)**, Joshi, C. and J. Seay (2015): “An Appropriate Technology Based Processor for Sustainable Production of Biodiesel and Non-Synthetic Pesticide in Underdeveloped Regions”, *4th International Congress on Sustainability Science and Engineering*, Balatonfüred, Hungary.
21. **2nd Place Research Award (tie)**, Croft, W. and J. Seay (2015): “Sustainability Assessment Methodology for Appropriate Technology Based Products in Developing Regions”, *4th International Congress on Sustainability Science and Engineering*, Balatonfüred, Hungary.
22. **1st Place Award for Undergraduate Research – Sustainability I**, Croft, M and J. Seay (2014): “Optimization of Low Cost Biodiesel Washing Process from Locally Sourced Materials for sub-Saharan Africa”, *AICHE Annual Student Conference*, Atlanta, GA.
23. **1st Place Award for Undergraduate Research – Sustainability II**, Buckhalter, D and J. Seay (2014): “Determining an Appropriate Solvent for Extracting Oil from Spent Coffee Grounds for Producing Biodiesel”, *AICHE Annual Student Conference*, Atlanta, GA.
24. **1st Place Award for Graduate Research in Sustainability**, Sukumara, S., and J. Seay (2013): “Process Optimization Models Supporting Multidisciplinary Framework for Sustainable Biorefining”, *AICHE Annual Meeting*, San Francisco, CA.
25. **3rd Place Award for Undergraduate Research in Sustainability** Croft, M. and J. Seay (2013): “Development of Low Cost Biodiesel Washing Process for Sub-Saharan Africa”, *AICHE Annual Student Conference*, San Francisco, CA.
26. **Outstanding Graduate Research Award**, Sukumara, S., J. Seay, F. Badurdeen, W. Faulkner and J. Amundson (2013): “A Framework to Examine Sustainability of Various Biorefining Processes”, *3rd International Congress on Sustainable Science and Engineering*, Cincinnati, OH.
27. **Outstanding Undergraduate Research Award**, Willett, C. and J. Seay (2013): “Design of a Sustainable Process for Separation of Methanol from Wood Vinegar in Sub-Saharan Africa”, *3rd International Congress on Sustainable Science and Engineering*, Cincinnati, OH.
28. **Outstanding Undergraduate Research Award**, Croft W. and J. Seay (2013): “Biofuel Sustainability Assessment for Developing Regions”, *3rd International Congress on Sustainable Science and Engineering*, Cincinnati, OH.
29. **Outstanding Undergraduate Research Award**, Croft, M. and J. Seay (2013): “Interfacial Phenomena in the Production of Low-Cost Biodiesel in Rural Africa”, *Proceedings of the 3rd International Conference on Sustainable Chemical Product and Process Engineering*, CD-Volume, Dalian, China.
30. **Outstanding Undergraduate Research Award**, Croft, W. and J. Seay (2013): “Developing an Optimal Chemistry for Producing Low Cost Biodiesel from Local Feedstocks in Rural West Africa”, *Proceedings of the 3rd International Conference on Sustainable Chemical Product and Process Engineering*, CD-Volume, Dalian, China.

31. **Honorable Mention**, Butler, B., M. Croft, W. Croft, K. Lewis, M. Peeler, Z. Watson, C. Willett, D. Silverstein and J. Seay (2013): “Developing a Novel Low Cost Biodiesel and Biochar Processor for Rural Cameroon Using Locally Sourced Materials and Feedstocks”, *US EPA People, Prosperity and the Planet Student Design Competition*, Washington, DC.
32. **1st Place Paper Award**, Willett, C. and J. Seay (2013): “Separation of Methanol from Wood Vinegar”, *Proceeding of the 2013 Math Engineering and Science Conference*, CD-Volume, Evansville, Indiana.
33. **Honorable Mention**, Peeler, M. and J. Seay (2013): “An Integrated Process for Sustainable Biofuel production in Sub-Saharan Africa through Appropriate Technology”, *AIChE Southern Regional Student Conference*, Lexington, Kentucky.
34. **1st Place Award for Undergraduate Research – Environmental Science and Engineering II**, Croft, W. and J. Seay, (2012). “A Renewable Process for Producing Low-Cost Biofuel and Biochar for Rural West Africa”, *AIChE Annual Student Conference*, Pittsburgh, Pennsylvania.
35. **3rd Place Award for Undergraduate Research - Education**, Mott, L., D. Silverstein and J. Seay, (2012). “Inductive Methods of Teaching Batch Distillation Through Simulation”, *AIChE Annual Student Conference*, Pittsburgh, Pennsylvania.
36. **Council of Supply Chain Management Professionals (CSCMP) Paper Award**, Amundson, J., W. Faulkner, S. Sukumara, J. Seay, F. Badurdeen, (2012). “A Bayesian Network Based Approach for Risk Modeling to Aid in Development of Sustainable Biomass Supply Chains”.
37. **Best Poster Award for Graduate Research**, S. Sukumara, F. Badurdeen and J. Seay (2011): “Multidisciplinary Approach in Developing a Region Specific Optimization Model for Sustainable Biorefining”, *Tracy Farmer Institute for Sustainability and the Environment 2nd Annual Research Showcase*, Lexington, Kentucky.
38. **Third Place Award – Paper Competition**, Whipple, W. and J. Seay (2011): “Linking Glycerol Dehydration Chemistry and the Biodiesel Lifecycle”, *2011 AIChE Southern Regional Student Conference*, Atlanta, Georgia.
39. **Best Poster Award for Undergraduate Research in Chemistry**, Whipple, W. and J. Seay (2011): “Production of Biodiesel and Analysis of Related Interfacial Phenomena”, *2011 Math Engineering and Science Conference (MESCON)*, Evansville, Indiana.
40. **Best Poster Award for Undergraduate Research**, Whipple, W. and J. Seay (2011): “Interfacial Phenomena in Biodiesel Production”, *2nd International Congress of Sustainability Science and Engineering*, Tucson, Arizona.
41. **Outstanding Undergraduate Research Award**, Ramsey, A, S. Sukumara and J. Seay (2010): “Development of Multidisciplinary Region Specific Economic Models for Integrated Biorefining”, *2nd International Symposium on Sustainable Product and Process Engineering*, Hangzhou, China.
42. **1st Place Award for Undergraduate Research – Environmental Science and Engineering**, Ramsey, A and J. Seay (2009): “Development of Region Specific Optimized Integrated Biorefinery Models”, *AIChE Annual Student Conference*, Nashville, Tennessee.
43. **Best Poster Award for Undergraduate Research**, Richardson, L. and J. Seay (2009): “Optimizing the Catalytic Cycle for the Dehydration of Biobased Glycerol to Economically Viable C3 Compounds”, *1st International Congress on Sustainability Science and Engineering*, Cincinnati, Ohio.

Local and International Print Media Coverage

How to make diesel from plastics

After observing how Kampala streets are littered with plastics, an idea was hatched on how to conserve the environment and the result is technology that can make diesel out of plastics waste.

BY LOMINDA AFEDRARU
alominda@ug.nationmedia.com

A group of seven students from Makerere University College of Agricultural and Environmental Sciences together with students from the University of Kentucky, College of Engineering in UK are manufacturing diesel oil from plastics.

The innovation is being piloted at Makerere University Agricultural Research Institute Kabanyoro (MUARIK) in Wakiso District with promising results.

The students, who produced oil in small quantities, are using it in portable tractors commonly known as Mulimu for various agricultural activities in student farms within MAURIK.

Associate professor Jeffrey Seay from Kentucky University College of Engineering while explaining the process of producing the oil said studies have been conducted in laboratories of a number of universities including University of Leeds.

"The studies were done mainly for research purposes where scientists experimented thermal conversion of plastics to produce a mixture of hydrocarbons. These are found in many places, including crude oil and natural gas. Another study was done by scientists from the University of Ilorin in Nigeria where they decomposed high density plastics. The results showed production of clean diesel oil which can be used in motor vehicles and farm equipment which use diesel oil," he explained.

Inspiration

He explained that the team of professors from both universi-



A man demonstrates the process of making diesel from plastics. PHOTOS BY LOMINDA AFEDRARU

ties introduced the technology to students after observing people throwing plastics littering the environment yet it does not decompose.

"Looking at the statistics globally, there are more than five trillion plastic pieces weighing more than 250,000 tonnes afloat water bodies. When the head of CAES Prof Bernard Bashaaha visited the University of Kentucky and saw what the students are doing, we thought of bringing the technology to Uganda with an aim of saving the environment from littered plastics which is a challenge globally," adding that the technology is not costly.

About the project

It is a one year project billed \$50,000 about (Shs168 million) where students will be expected to take up the innovation and implement it for purposes of selling and marketing oil produced.

Commercial farmers are also expected to take on this technology for purposes of producing diesel oil which can be used in farm equipment during ploughing and harvesting.

He explained that there are seven types of plastics namely clear not usable plastics, polyvinyl chloride (PVC) plastics numbered 2,3,4,5 and 6. The ones made out of Carbon and oxygen namely, PVC 2,4,5,6 can be used for producing the oil.

HOW IT WORKS



The students who picked interest in the technology are five from the University of Kentucky and seven from Makerere University.

Denis Omulo, a student pursuing his masters' degree in Agricultural Engineering at Makerere University, explaining how the oil is processed says it starts with burning of firewood in a rocket stove made out of steel in form of

drum.

"The rocket stove containing a hole in the middle is covered with a steel blade which protects the container or processor where plastics are dropped for heating. This is to avoid direct source of energy from the fire because we have a thermometer which we use for measuring the temperature. The recommended one is between

425 - 450 degrees Celsius. We keep dropping recommended plastics of different types; it could be a broken basin, bottle plastics, plastic spoons, forks and cups used for taking tea in restaurants among others. The heating is continuous depending on what quantity of diesel oil one wants to produce. The major thing to know is that 1 kg of plastics will produce 1 litre of diesel oil" he explained.

As the stove gets heated, a pipe is connected to a clean bucket containing clean water which is half way. This is to create space for oil to float on top of water which is later filtered by pouring it in a container.

"This oil is much cleaner compared to diesel oil made out crude substance which contains sulphur leading to a lot of smog produced into the atmosphere. We are also mindful of using less firewood to avoid depletion of trees in the environment. The diesel fuel produced can be used by small scale farmers when irrigating their farms with equipment that uses diesel oil for running its operation.

"Apart from using fuel wood, equipment that uses solar energy can be used for heating provided the recommended temperature is attained," he explained.

US Team Lands in Tiruchuli for Study on Fuel from Plastic Waste

Express News Service

Virudhunagar: A professor of chemical engineering and 12 students from University of Kentucky, USA, are carrying out research on sustainable energy and agriculture with the Organisation for Development Action and Maintenance (ODAM), an NGO based in Tiruchuli, in the district.

The team from Kentucky is focussed on implementing sustainability projects in underdeveloped and rural regions around the world.

During its visit to Tiruchuli, the team is carrying out two preliminary researches by converting waste plastic into fuel and extracting organic pest repellent using *Prosopis Juliflora* (seemai karuvellam tree), along

with the members of ODA.

Speaking about the research, the associate professor of Chemical Engineering Jeffrey Seay said, "We planned to carry out research in Tiruchuli with ODA as Tamil Nadu is an ideal place for us, as the state government is working on recycling the waste. As we want to contribute to the efforts of the government we are carrying out two researches at Tiruchuli from June 14 to July 24."

While demonstrating the process of extracting fuel through plastic waste, Jeffrey Seay said the polythene covers and plastic items (represented by recycling numbers 2, 4, 5, 6) could be used to produce fuel that is an alternative to kerosene or



Jeffrey Seay, Associate professor of Chemical Engineering, University of Kentucky, USA, explaining the research work carried out at Tiruchuli in Virudhunagar district | EXPRESS

diesel. In this method, the plastic waste is heated in a specially designed barrel and its vapour is collected inside

a can through a tube. The water stays at the bottom and the fuel stays above the water inside the can.

"When we tested the fuel in the irrigation pumps, we found the efficiency of the fuel was 75 per cent more

than the existing fuels, such as kerosene and diesel. If a kg of plastic waste is heated, we will get more than one litre of fuel. The fuel will be cost-effective to the farmers as they will be able to produce it easily", said Jeffrey Seay.

He said that as most of the people in this region were making and selling biochar for their livelihood, "we did also research by creating an organic and non-toxic pest repellent while heating the wood of *Prosopis Juliflora* in a barrel. The vapour obtained from the barrel is condensed using a radiator in order to extract the pest repellent."

"For every four kg of wood, we can extract nearly three litres of pest repellent. By adopting this simple method,

the people can get both biochar and pest repellent. The pest repellent should be mixed with water and sprayed on the crops", he explained.

"We have carried out the research of biochar in Cameroon but the research of converting plastic waste into fuel is being done for the first time in Tiruchuli", claimed Jeffrey Seay. Both these researches are eco-friendly, he added.

The ODA executive coordinator J Elango said that after the formal process of performing emission test for both these researches, "we will be creating an awareness and a training programme to the people about the process of extracting fuel from plastic waste and extracting pest repellent from biochar".

**Footboard
Travel Costs
Boy His Toes**

Tiruchuli: A 15-year-

Registration of Marriages Not Compulsory: HC Bench



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(Recognized by Government of India)

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Lawyers say election complied with the law p6,7&10

MBABAZI HAS NO EVIDENCE, SAYS MUSEVENI TEAM

VISION @30

Readers to get school fees

As part of the celebrations to mark its 30th birthday, New Vision has launched a major campaign to which you could win millions of shillings for school fees. The "School Fees Lottery" promotion will run for eight weeks - from March 21 to May 21. Lucky readers will walk away with different categories of prizes ranging from students in primary and secondary schools as well as university.

See story on page 4



Seven pages inside

LAND

Row erupts over Iganga town land

Trucks carrying heavy loads of sand, bricks and other construction materials were the first sign that the taxi park in Iganga town was about to get a facelift. What was not yet clear was when the construction was to take place, as that was a closely-guarded secret until the very last minute. Later, the foundation of a double-decked structure was in place as rival parties accused each other of encroachment.

See story on page 14

POLITICS

Besigye petitions Police against deployment

Story on page 4

MAKERERE STUDENTS RECYCLE PLASTICS INTO DIESEL



Prof. Noble Banadda (third-right) with students from the University of Kentucky and Makerere University College of Agricultural and Environmental Sciences holding the diesel oil they made from plastics. Photo by Mwanza Kamukama. SEE STORY ON PAGE 4

PEOPLE & BUSINESS

CONTINUED FROM 2A

resource, and most recently served as both the director of business services and as the secretary-treasurer for the corporation.

Rambo also served as the plan administrator for the company's pension plan, health and welfare plan, and the 401(k) plan. These plans had in excess of \$150 million in assets under management. Rambo and his family reside in Cunningham.

■■■■
Jeffrey Seay, assistant professor of chemical engineering of the University of Kentucky's Paducah engineering programs, was recently awarded the American Institute of Chemical Engineers inaugural Sustainability Education Award. The award was presented to recognize and honor outstanding contributions to sustainability education, and was judged primarily of the signifi-



Seay

cance of his contribution and active leadership leading to the advancement of sustainability education in engineering.
David L. Silverstein, professor of chemical engineering and director of the University of Kentucky's Paducah engineering programs, recently completed the inaugural eight-week Innovation Corps for Learning program. The National Science Foundation sponsored program is an invitation-only effort to increase propagation and sustainability of innovations in STEM education through development of



Silverstein

entrepreneurial skills normally applied to the commercialization of technological innovations.
 Silverstein was selected for one of nine teams of previous NSF grantees nationwide based on his role in developing the highly successful instructional resource the AIChE Education Division Concept Warehouse, a web-based platform that improves conceptual learning by enabling deployment, assessment, analysis, and propagation of educational innovation.

■■■■
 Richard Grana, president

of **Impex** in Paducah, announced he has signed a new distribution agreement with Optimal FTS in Ankara, Turkey, to market, sell and distribute Arch Environmental Equipment. Impex is the International Sales and Marketing Company that is retained by Arch Environmental Equipment to maintain an international sales force by recruiting and training distributors across

the globe. This agreement is one of many already being internationally retained by Impex.

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Valuable Inserts

The following inserts are in today's edition of

The Lineup

Monday

Allied/Honeywell retirees, breakfast, 7:30 a.m., The Waffle Hut on old Cairo Road, near Interstate 24, Exit 3.

AARP with IRS offers free tax service to low- and moderate-income individuals, with special attention to those age 50 and older, 9 a.m. to 1 p.m., Paducah-McCracken County Senior Center, 1400 H.C. Mathis Drive. 270-443-8579 for appointment.

Paducah Senior Center, free low-impact exercise for individuals age 60 and older, 10–11 a.m., 1400 H.C. Mathis Drive, second floor.

Veterans and families, lunch, 11 a.m. to 1 p.m., back room, Ryan's Steakhouse in Paducah. Sandy Hart, 270-210-2452 or 270-335-3128.

Baptist Health Paducah Stroke Support Group, 3 to 4:30 p.m., Baptist Heart Center conference room. Light refreshments. Mary Legge, 270-575-2880 to register.

Hospice Grief Support Group, 5 to 6:30 p.m., Lourdes North Plaza, 911 Joe Clifton Drive. Frank Queen, 270-415-3636.

Baptist Health Paducah Prepared Childbirth Classes, 5 to 8 p.m., Meeting Room A, Doctors Office Building 2 at Baptist Health Paducah. 270-575-2229 to register.

Graves County Public Library, Lego program at 5:30 p.m. 270-247-2911.

Grief Support Group, Parents, 5:30 to 7 p.m., Franciscan Room at Lourdes hospital. Nancy Litchfield, 270-519-3491.

Season of Honor Support Group meeting, Caring for your Aging Loved One, 6:30 p.m., First Baptist Church Fellowship Hall, 2890 Broadway, Paducah. Topic: "When Love and Honor Come With a Price." Presenter: Sherry Bone, M.S., LPP, Christian Counseling of Western Kentucky.

■■■
Items for the Lineup must be received in writing five days in advance. Mail to: Lineup, The Paducah Sun, P.O. Box 2300, Paducah, KY 42002-2300; fax the newsroom at 270-442-7859; or email news@paducahsun.com. Announcements are published day of event. Information:

UK students ship 2,000 pounds of school books to African village

BY KAYLAN THOMPSON

kthompson@paducahsun.com

A cinder block schoolhouse sits in the city of Njong, Cameroon, empty aside from wooden benches, a small chalkboard and a few rays of sunlight from a lone window, awaiting the arrival of 2,000 pounds of textbooks traveling from Paducah by truck and then by cargo ship.

Since 2014, Dr. Jeffery Seay, assistant professor at the UK College of Engineering Paducah Campus, has led efforts with the help of about 20 students and countless UK staff and community members to acquire the needed textbooks and \$7,300 shipping fee.

On Saturday, a Georgia-based shipper — who happens to be from the same Cameroon village — came to pick up the books and send them on their 4-month journey to his hometown.

"I couldn't believe what was happening," said Emmanuel Fonji, chief operating officer and owner of One Way Group shipping. "It was just meant to be, and this is just the beginning of a trend of education for our country."

The story is serendipitous. Initial quotes showed shipping costs peaking at \$30,000. When Fonji received the call and learned that the books were benefiting students in his hometown, he lowered the cost and knew he had to help.

"If someone else can be excited about your own country like this, I had to do all that I could to make sure this happened," he said.

Fonji's wife, Evodia, is also a native of Cameroon. Having had the opportunity to attend a boarding school and receive an extended education when she was younger, she knows the importance books have on children's lives.



KAYLAN THOMPSON | The Sun

Emmanuel and Evodia Fonji (from left), natives of Njong, Cameroon, visit the students, faculty and staff of the UK College of Engineering Paducah campus, Mayor Gayle Kaler and Ken Wheeler. On Saturday morning, the Fonjis, owners of a Georgia-based shipping company, picked up 2,000 pounds of school books collected by the UK College for students in Njong.

"This book run, for people here they may not really see its importance, but in Cameroon it's a big deal because the books, the libraries are not there," she said. "For the school these books are going to, starting a library is a one in a million happening."

The blessing will extend through the entire community, she added, as many of the students will get to hold a book for the first time.

"Oh Lord, it's going to be a miracle, a huge blessing!" she said. "The kids don't even know what it is to own a book. And for the parents, getting to introduce their kids to reading, and building a library is really enriching."

The books were donated primarily from local schools, including Paducah Tilghman High School, the St. Mary School System, Lone Oak schools and the former Heath High School. The subjects include pre-algebra, geometry, spelling, geography, science and biology for various grade levels. The shipping cost was raised by vari-

ous business and individual donors, including Lourdes hospital and Paducah resident Ken Wheeler.

Chandi Joshi, a junior in the chemical engineering program, has been active in the project since her senior year at Heath High School, helping collect 1,500 books from her school.

"We have all these resources here, and sometimes we don't take advantage of it," she said.

"Those students barely have enough to get by, and they're so willing to put all of themselves into being successful and educated. So giving these books is our part in helping them grow and educate them and eventually, it will affect generations in those schools."

Seay regularly takes classes on study abroad programs to places like Cameroon, India, Hungary, Uganda and China. It was a trip to Njong in 2012 that ignited the idea for the book drive.

"As engineers, we tend to be focused on math and sci-

ence and computers, but it's important for students to realize the important role they play in the world," Seay said. "We talk about the challenges facing society, and in all aspects engineers have a role to play. It's important for them to see how the decisions they make as engineers affect people in other communities, whether it's by providing jobs or utilizing resources from around the world."

The program benefits the students in so many ways, Seay said, broadening their horizons and encouraging them to realize that all cultures need and want the same things.

"When you get down to a person-to-person interaction, all the global politics fall away. It's a big responsibility," he said. "We are ambassadors from UK (College) and ambassadors from the United States, and it is important that we leave them with a positive impression of our nation, our college, students and engineers."

Empty Bowls to host glaze-a-thon

BY KAYLAN THOMPSON

kthompson@paducahsun.com

The Empty Bowls Project of Paducah will host a Glaze-a-Thon from 5 to 8 p.m. Monday at the Paducah School of Art and Design's location on Madison Street.

Arts enthusiasts of all skill levels are invited to glaze a bowl for use at the Empty Bowls Dinner and Auction on Feb. 20.

While many community members may not be able to make large donations to the Empty Bowls Project or to other deserving organizations serving Paducah, helping to create the bowls is one step a person can make to address the need of hunger locally.

"Every time you light one candle, you push back the darkness even just a little bit, and you don't stop lighting candles just

In Our Schools

■ Reidland Intermediate SBDM — 7:30 a.m. Monday, library.

■ Livingston County Middle School's Academic Performance Committee — 3:15 p.m. Monday. Cardinal Room



Engineering student wins first place at international research forum

Chandini Joshi, a University of Kentucky College of Engineering-Paducah campus undergrad student, stands with her research adviser, Jeffrey Seay, after winning first place at the 5th International Research Forum on Sustainable Manufacturing in Lexington recently. Joshi competed against master's and doctorate students. Her research poster was titled "An Appropriate Technology Based, Sustainable Process for Converting Waste Plastic to Fuel Oil in Rural India."

Open house set to honor Legate

Staff report

Geneva Dove Legate of Paducah will be honored on her 100th birthday with an open house from 2 to 4 p.m. Saturday, Oct. 10 at 305 Oaks Road, Paducah. All friends and relatives are invited.

Mrs. Legate was born Oct. 9, 1915, in Graves County to Etta and Ed Dove, who later moved to Paducah.

Mrs. Legate married Cliff Legate of Mayfield and they were married 48 years before his death in 1979.

Mrs. Legate is the mother of the late W.R. Legate, who died in 1990.

She is the grandmother of Randy Langston of Dukedom, Tennessee, and has two great-grandchildren.

Other family members include her sisters, Betty Freeman of Paducah,



Legate

Gladys Jackson of Paducah, and Rosa Lee Flood of Chattanooga, Tennessee; her brother, James Robert Dove of Paducah; and several nieces and nephews.

Mrs. Legate worked for Merit Clothing Co. of Mayfield for 35 years. She likes to travel and enjoys working in the yard and her flowers.

McCracken 4-H shooting club hits high marks in competition

Staff report

The McCracken County 4-H Hot Shots Shooting Sports Club participated in the annual State Shooting Sports Competition recently in Berea and Wilmore. Competition results are as follows:

■ Archery Recurve 9-11 — Gracie Johnson, 3rd place Individual Award.

■ .22 Sport Rifle 9-11 — Molly Riley, 3rd place Individual Award.

■ .22 Target Rifle 15-18 — Carson Riley, 2nd place Individual Award.

■ BB Rifle 9-11 1st Place Team Award — Austin Dennison (2nd place Individual), Zak Morgan, Gantry Rasche, Owen Sederstrand.

■ BB Rifle 15-18 1st Place Team Award — Audrie Swain, Caroline Rasche, Nicholas Dennison, Jacob Dennison.

■ Air Rifle Sport 9-11 1st Place Team Award — Owen Sederstrand (1st place Individual), Molly Riley (2nd

Austin Swain.

■ Air Rifle Sport 15-18 1st Place Team Award — Gabe Puckett (3rd place Individual), Hutch Puckett, Nicholas Dennison, Jacob Dennison.

■ Air Rifle Target 12-14 1st Place Team Award — John Putney, Austin Swain, Charlotte Sederstrand, Sara Williams.

■ Air Rifle Target 15-18 1st place Team Award — Carson Riley, Hutch Puckett, Gabe Puckett, Audrie Swain.

■ 22 Sport Rifle 12-14 2nd Place Team Award — Charlotte Sederstrand, Ike Morgan, Josie Sederstrand, John Putney.

■ Air Pistol 9-11 1st Place Team Award — Molly Riley (1st place Individual), Austin Dennison (2nd place Individual), Gantry Rasche, Owen Sederstrand.

■ Air Pistol 12-14 2nd Place Team Award — Isaac Daily (3rd place Individual), Sara Williams, Josie Sederstrand, Charlotte Sederstrand.



Members of the McCracken County 4-H Hot Shots Shooting Sports Club rifle and pistol team include (front row, left to right) Owen Sederstrand, Austin Dennison, Molly Riley, Gantry Rasche, and Zak Morgan; (second row, left to right) Audrie Swain, Josie Sederstrand, Charlotte Sederstrand, and coach Lance Morgan; (third row, left to right) Jacob Dennison, Gracie Johnson, and Sara Williams.



Students from the Paducah campus of the University of Kentucky College of Engineering aided residents of a village in Cameroon, in part by researching production of biodiesel.

Engineering students aid village

While Americans may complain about fuel prices, the availability and access to transportation fuel is something that most can take for granted. Several local University of Kentucky College of Engineering Paducah students recently learned that is not necessarily so in other areas of the world.

Jeffery Seay, assistant professor of chemical and materials engineering at the UK Paducah campus, led seven UK Paducah chemical and mechanical engineering students in a design project to develop low-cost, environmentally friendly technologies to produce biodiesel for rural villagers in Cameroon, Africa. Seay and the students worked with the African Center for Renewable Energy and Sustainable Technology (ACREST) to design the process using resources and materials readily available in Cameroon. A 10-day trip to Bangang, Cameroon, to work with the local villagers in implementing and refining the design was the culmination of the year-long project.

"To say the trip was eventful is an understatement," Seay said. "After over 18 hours of flying, our bus ride to the village of Bangang was the

students' introduction to transportation difficulties in the developing world. The bus could not go up the muddy hillside road, so at about 10 p.m. we had to carry everything we brought — our supplies for the project, our personal belongings and supplies we brought for local school children — about three miles up the hillside in the pouring rain. It took us over two hours to walk to the village."

According to Seay and the students, the trip got better. Working with ACREST technicians, the group implemented their reactor design. The principle behind the design, Seay said, was to construct the biodiesel processor for less than \$100 in U.S. dollars and to use construction and processing methods easily explained to people with little or no formal education. In addition, the students were charged with ensuring the materials used were readily available to locals. With old oil drums, car parts and scrap metal the students constructed a processor that used wood or charcoal as heat.

Chris Sterrie, a senior mechanical engineering student from Paducah, worked on the processor. "The first thing we

discovered is that the truth about engineering is being able to think outside the box. It isn't that our basic design changed, it's more that we learned how to change the design to adapt to what we had," Sterrie said.

Sterrie and Bradley Butler, another senior mechanical engineering student from Paducah, were able to change their design to fit what was available and make the processor work.

"That first batch of biodiesel — and it was less than a gallon — was like looking at gold," Butler said. "A few days after we got home I was at a gas station and a big truck pulled in and filled up with diesel. I don't think I'll ever look at things like that the same."

Seay said that was an important lesson for the students. "Normally engineers would look to new technologies for a design project. What our students had to learn was how to use older technologies due to the lack of modern infrastructure." Seay noted that while Bangang has approximately 200 homes, ACREST is able to provide low-cost electricity to only 15 of those.

Christina Willett, a chemical engineering

junior from Gilbertville, said she did not realize the impact her career choice could make. "Seeing firsthand what engineering has done and can do for our world made a huge impression on me," Willett said.

Mitchell Peeler, a chemical engineering junior from Eddyville; Max Croft and William Croft, chemical engineering sophomores from Paducah, and Zac Watson, a mechanical engineering junior from Symsonia, found getting to know the villagers and their culture an important lesson as well. The students brought school supplies for the village school. But Peeler brought something he thought the local children would enjoy even more — a couple of futbols, or soccer balls.

"The local kids were so cool," Peeler said. "They would hang out with us and they loved to play futbol. So we would go out there and play with them and they taught us some games as well."

The Crofts said they were impressed with the villagers' hospitality.

"Every evening they put food on the table for us. It was like whatever they had they offered to us," Max Croft said.

His brother, William, agreed.

Anniversary



Robert and Ruth Robertson

BOAZ — Mr. and Mrs. Robert Earl Robertson of Boaz will celebrate their 50th wedding anniversary with a reception from 1 to 3 p.m. Saturday, Feb. 27 at Mount Pleasant Baptist Church Fellowship Hall, 545 Locust Drive, Paducah. All friends and relatives are invited.

Mr. Robertson and the former Laverta Ruth Langston were married Feb. 26, 1966, at the home of the bride's sister, Lola and Delbert Reed of Paducah. The

Rev. Clayton Wyatt officiated. Their attendants were Randal and Faye Sanderson.

Mrs. Robertson is the daughter of the late Levi and Lona Langston.

Mr. Robertson is the son of the late William and Lorea Robertson. He is retired from Laborers Local Union No. 1214.

They are the parents of Cindy Shoulta of Benton and Neal Robertson of Boaz. They have three grandchildren and two great-grandchildren.

UK Paducah students attract \$15,000 grant for pest project

Staff report
The Environmental Protection Agency has announced that a student team from the University of Kentucky-Paducah campus will receive one of 38 People, Prosperity and the Planet (P3) grants to fund proposed projects to develop new, sustainable products and strategies.

Each team selected by the EPA will receive up to \$15,000. The Paducah research team will receive \$14,994 to develop a sustainable, low-cost method for producing a non-synthetic pest repellent, known as wood vinegar, from existing biochar production techniques present in rural regions of Cameroon, and Tamil Nadu, India. The benefit of this approach is a reduction in atmospheric

pollution by collecting and condensing the released chemicals into a useful and inexpensive, non-synthetic pesticide, herbicide and fungicide.

"This year's P3 teams have created innovative research projects that tackle some of our most pressing environmental and public health challenges," said Thomas A. Burke, EPA's science adviser and deputy assistant administrator of EPA's Office of Research and Development. "These students have the opportunity to bring their exciting new ideas for innovation in sustainability to life, by expanding their learning experience beyond the classroom."

Funding for the P3 competition is divided into two phases. Teams selected for Phase I awards receive grants of up to \$15,000 to fund the development of their projects, which

are then showcased at the National Sustainable Design Expo in the spring. Following the expo, P3 teams compete for Phase II awards of up to \$75,000 to further develop their designs and potentially bring them to the marketplace.

Other projects that will be funded this year's teams include testing innovative ideas such as repurposing chemical byproducts from the mining industry into new concrete that helps inhibit the corrosion of steel and developing a food waste collection kiosk that will spur food waste to energy production in the local community.

Previous P3 teams have used their sustainable ideas and gone on to start businesses. Lucid Design traces its beginnings back to the EPA's first P3 award to the founders' Oberlin

College team in 2004. Lucid Design specializes in tracking and analyzing energy consumption and resource use data for clients that include Google and Sony.

In 2011, a P3 team from Embry-Riddle Aeronautical University developed a portable, solar powered, water purification system in the form of a backpack. The team went on to launch AquaSolve Ventures to produce backpacks that are capable of purifying 4,300 gallons of water a day.

Yet another P3 success is the startup OneEarth Designs, which specializes in solar powered technology, formed from a 2010 Harvard University P3 team. One Earth Designs' signature product, the SolSource 3-in-1, is a 100 percent solar powered grill that can harness the power of the sun to provide home heating and electricity.

Man explores Missouri waters for fish

BY WES JOHNSON
Springfield News-Leader
SPRINGFIELD, Mo.

— With snorkel and mask and net in hand, Tyler Goodale plies the Current River, The Jacks Fork and other Missouri streams at night, looking for living treasure.

"Some of these small creeks around here are just chock full of amazing fish," Goodale said. "When people paddle canoes down a river, most have no idea what's right below them."

Goodale, a construction worker who lives in Wapapello, became fascinated with what lives in Missouri streams when he was a young boy.

"My dad got me into fishing, and we'd go catch bait and I'd see these different colorful fish that just blew me away by how neat they were. In the 1990s I saw my first 'Fishes

of Missouri' book at a library. I had no idea we had these beautiful fish in my home state.

People might catch a dozen or so kinds of fish regularly, but there are 240 different species in the state of Missouri."

The Springfield News-Leader reports that over the years he has honed his fish-catching technique, and uses a cellphone to photograph the creatures he finds, some as brilliantly hued as anything you'd see in the Caribbean.

"I catch them with a dip net, often at night when they can't see you sneaking up on them," he said. "I'll drag my canoe to a gravel bar and get in the water. After a while the fish will be curious about you and will come right up to you. The brook darters and rainbow darters have almost every color there is."

One of his most thrilling catches was a

rainbow darter in full mating color he netted in a small creek in the city limits of Doniphan.

"I'll snorkel streams and rivers all summer long, looking for fish," Goodale said. "It's real peaceful being in their environment. On a lot of the small rivers you don't see too many people."

Goodale said he grew up in the country and had no neighbors for miles. "I fell in love with nature at a very young age, and fish were some of the first critters I came on contact with," he said.

He recently posted several of his photos on the Current River, Jacks Fork & Eleven Point River Facebook page, drawing in admiring comments from paddlers.

One of the most unusual fish he has caught—and released after photographing—is a central stoneroller.

"This gnarly looking fish, the central stoneroller, is actually a native of the Current River watershed and many other Ozark streams," he wrote in a post about the strange-looking fish.

"These are super important fish species, making up to 85% of the diet of Smallmouth Bass in most Ozark streams. The school of minnow sized fish with bright gold flashes you see on the summertime riffles, are almost surely these guys right here."

Though he has photographed fish, cottonmouth snakes, turtles and insects, Goodale said he has yet to find the "Holy Grail" of river fishes. "That would be a Niangua darter," he said. "I haven't seen one. They're kind of a ghost fish. They are a protected species in the Niangua River, the only place in Missouri where they're found."

Credits in criminal just credit transfer

Staff report
An agreement between Murray State University and West Kentucky Community and Technical College will allow a set of designated courses in criminal justice to be transferable between the two schools beginning in the fall of 2016.

Students working toward a bachelor's degree in criminal justice will be able to begin at WKCTC if they choose. The students can obtain

an associate's degree in criminal justice at the community college and apply certain courses to Murray State if they decide to pursue further education in the same field.

In the past, not all courses completed at WKCTC could be transferred for credit at Murray State. The success of the partnership could lead to similar agreements in other fields of study between the two schools.

The Lineup

Monday

Farley Neighborhood Watch Association, 6:30 p.m., Farley Elementary cafeteria, 1250 Husband Road. 442-6704.

Paducah Masonic Lodge No. 127 F&AM, 7:30 p.m., 24th and Jackson streets. Meal at 6. 443-3127.

McCracken County Conservation District, 7 p.m., Kentucky Farm Bureau Building, 5470 U.S. 60 West, Suite B. 408-1244.

In our schools

- Graves County Board of Education — called meeting, 6 p.m. Monday, central office.
- Hendron-Lone Oak Elementary School SBDM — 2:30 p.m. Monday, library.
- Clark Elementary School SBDM — 1 p.m. Monday, guidance office.
- Paducah Tilghman High School SBDM — 10 a.m. Thursday, school library.
- Concord Elementary School SBDM — 11 a.m. Monday, Logan's Roadhouse.

Lone Oak resident faces burglary charges

Staff report

After an alleged residential burglary and an investigation that included an ATF agent and two bomb squads Saturday morning, a Lone Oak resident faces state and federal charges.

Jon M. Mullins, 42, was arrested and charged with first-degree burglary, possession of a firearm by a convicted felon, first-degree criminal mischief, fleeing or evading on foot, possession of burglary tools, and theft by unlawful taking, more than \$500, according to a news release from McCracken County Sheriff Jon Hayden.

The homeowner called 911 around 4:20 Saturday morning and told a dispatcher she thought someone had broken in. She said she was hiding inside a closet at her home on the 4000 block of Magruder Road. The dispatcher stayed on the line with her while the suspect opened the closet door. The caller confronted the suspect with a loaded pistol just as McCracken Sheriff's Sgt. David Shepherd arrived, Hayden said.

Mullins ran out the front door, and Shepherd chased him into a cornfield, tackled him and arrested him. The homeowner was not injured, police said.

Sheriff's deputies and the Paducah police found items hidden near the home's driveway that they believed Mullins had carried outside during the course of several trips into the residence. The items included a rifle

Please see **BURGLARY** | 3A

Saturday's lottery Kentucky

Pick 3-midday: 2-0-6
Pick 3-evening: 1-1-5
Pick 4-midday: 1-3-3-2
Pick 4-evening: 0-6-6-2
Cash Ball: 3-12-19-32 **CB** 23
Cash Ball Kicker: 0-4-9-5-0
5 Card Cash: 8H-9H-9D-KS-6D
Powerball: 05-06-37-41-54 **PB** 26 **PP** 3

Illinois

Pick 3-midday: 8-8-1 **FB** 6
Pick 3-evening: 3-4-5 **FB** 3
Pick 4-midday: 4-0-2-2 **FB** 9
Pick 4-evening: 7-2-7-9 **FB** 6
My 3-midday: 9-6-0
My 3-evening: 2-2-3
Lucky Day Lotto-midday: 10-17-25-33-38
Lucky Day Lotto-evening: 04-28-30-33-38
Lotto: 04-05-14-26-28-36 **Extra Shot:** 14



JOHN PAUL HENRY | The Sun

Summer Solstice Show

Mark Donham of Brookport, Ill., (center) talks with Julie Shaw of Paducah (left) and Lisa Depolsky of Durango, Colo., on Saturday during the Wastelanders Summer Solstice art show at 950 Park Ave. in Paducah. Special guests included Ellen Glasgow, Shane Gregory and Anne Sacora. The show will continue June 28 from 5 to 8 p.m. and June 29 from 2 to 4 p.m.

Paducah mayor's presence helps open doors in Gabon for university

BY CARRIE DILLARD

cdillard@paducahsun.com

Lambaréné, the capital of the Moyen-Ogooué district in Gabon, may just become Paducah's next "sister city."

Mayor Gayle Kaler, along with University of Kentucky-Paducah engineering professor Jeffrey Seay and chemical engineering undergraduate research student Chandni Joshi, visited Lambaréné in May.

The trip was intended to create continued opportunities for student research in the region, and Seay said the mayor's presence helped to make that happen.

"It's one thing for a professor and a student to show up," he said. "With Mayor Kaler, we got the attention of the head of state and high-ranking government officials. Her presence helped open doors."

UK has ongoing research in sustainable biofuels in nearby Cameroon, the country to the north of Gabon. Simultaneously with the trip to Gabon, a team of nine engineering students was flown to the village of Bangang, in rural Cameroon, to continue their research partnership with the African Centre for Renewable Energy & Sustainable Technology.

The university is looking to partner with the Gabonese government for the next phase in its research concerning bio-char, a charcoal by-product from the waste of that nation's bustling timber industry.

Because the soil in Gabon is clay-like and doesn't hold nu-



Submitted photo

The mayor of Lambaréné, Roger Valere Ayimambenwe (left), presents a key to the city to Paducah Mayor Gayle Kaler (center) during her trip to the African country of Gabon while University of Kentucky-Paducah engineering professor Jeffrey Seay looks on. Kaler, Seay and UK student Chandni Joshi visited Gabon in May to create opportunities for student research.

trients well, Seay explained, bio-char has the potential to be a soil additive for crops or used as a gas as a pesticide.

The university also hopes to foster a government-funded, study abroad project so students may return to Lambaréné each year to explore the possible uses of bio-char in the region.

Kaler brought legitimacy to their trip, Seay said.

"It was a benefit to us," he said. "We were told it was the first time a U.S. elected official had ever visited Lambaréné. It gave a high-profile nature to our visit."

UK extended the invitation to Kaler, and her travel arrange-

ments were made quickly, Seay said. The college had already secured funding for airfare for 10 students and Seay through an anonymous donor.

Seay said he went back to the donor for the extra airfare for Kaler.

Once the group reached Gabon, all expenses were paid by the government.

Kaler's visa was paid by the city of Paducah, at an estimated cost of \$142.

In many ways, Seay noted, the two cities are similar.

"Lamberene is about the same size (25,000 city population); it's in a lakes region; it has a timber industry and river industry," he said. "They have a

lot in common with Paducah."

Although many of its residents speak French, Gabon officials hope to make it a dual language country, he said. Because of this, the country may one day seek to hire retired teachers from Paducah and the surrounding areas to teach English overseas, he continued.

"This will be an opportunity for Paducah as well," Seay said. "They were impressed with Paducah's status as a UNESCO Creative City."

Paducah was invited into the Creative Cities Network last November, and lent its support for Suzhou, China, as it applied in the category of Crafts and Folk Art in April.

"Being a creative city has opened many avenues of connection with other countries," Kaler said. "They (Lamberene) would like to be a sister city. They are very interested in our help for ideas about tourism and exchanges for education."

While she wouldn't speculate about the possible economic benefits that Paducah could see through the partnership, she does believe cultural exchange is important.

"Economic benefits are more than just getting a building or company that moves in," Kaler said. "Being connected to the world increases your visibility as a community. That's the key; that connection, because we are in a global market."

Contact Carrie Dillard, a Paducah Sun staff writer, at 270-575-8657.

TeleTech job fair seeks 300 new employees

BY DAVID ZOELLER

dzoeller@paducahsun.com

TeleTech Holdings, the Colorado-based company planning to hire more than 300 people for its soon-to-open customer experience center in Paducah Commerce Park, will hold a job fair next week at West Kentucky Community & Technical College.

The job fair will be Tuesday through Thursday from 10 a.m.

to 6 p.m. at the Emerging Technology Building.

Employees at TeleTech's call center in the new 30,000 square-foot state-of-the-art facility will provide customer experience and communications services on behalf of a major health insurance company. The new site is one of two local call centers planned by TeleTech, the other being in the downtown commerce center, which

will be renovated in the coming months. That site is expected to house more than 100 additional employees.

The call center positions will cover a wide range, according to TeleTech, including customer service representatives, team leads, trainers, recruiters, technical assistance and IT, operations managers and facilities staff. Applicants are encouraged to go to www.teletechjobs.com to view open job descriptions and apply.

According to Jim Pape, vice president for workforce and economic development at the college, TeleTech officials have already been here conducting interviews and hiring. The college has been involved in discussions with TeleTech and local economic development of-

Please see **JOBS** | 6A

Coming Up ...

MONDAY



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Life & Leisure

Students provide chemistry lesson

BY DANIELLE RAY
dray@paducahsun.com

Sustainability is the name of the game for five Lone Oak High School students.

Seniors Sanjana Pampati, Andrew Stricklin, Michael Brinley, Cody Longsworth and Nolan Brelsford, all 17, are getting a taste of their unanimous career goal — chemical engineering — with hands-on projects alongside University of Kentucky College of Engineering professors and undergraduate students in Paducah.

The students demonstrated how to turn waste vegetable oil into biodiesel Wednesday morning at the Emerging Technology Center at West Kentucky Community & Technical College.

Stricklin said his favorite part of the project has been the process leading up to Wednesday's demonstration.

"I really liked watching the process of turning cooking oil into biodiesel — trying it on a small scale to familiarize ourselves with how to do it," Stricklin said.

The students first drained



JOHN WRIGHT | The Sun

Michael Brinley (left) and Andrew Stricklin, Lone Oak High School students, connect a hose to a pair of tanks, one containing cooking oil, at the Emerging Technology Center on the campus of West Kentucky Community & Technical College on Wednesday. They were among five Lone Oak students demonstrating how to turn vegetable oil into biodiesel.

wash water from a wash tank to cleanse the fuel inside. Next, they heated up a reactor, mixed a catalyst and put the mixture into the reactor. Finally, the students pumped the mixture into a sepa-

rator vessel to create biodiesel.

Jeff Seay, UK chemical engineering professor, has been working with the high schoolers twice a week since August.

"These kids are really sharp.

They've all had (Advanced Placement) chemistry, so they're definitely versed in the chemistry aspect," Seay said.

Pampati said she has always been interested in chemistry, but the project has fueled her enthusiasm for engineering. Pampati hopes to study chemical engineering at UK in Lexington, the University of Louisville or Washington University in St. Louis.

Besides becoming a chemical engineer, people who earn degrees in the field could work in factories or research renewable fuels, the students said.

The students are also helping undergraduates and Charles Lu, UK engineering professor, with an Environmental Protection Agency-funded project that involves turning side products — such as glycerin — into specialty products including antifreeze.

The students will present findings from the EPA project in Washington, D.C., in April.

Contact Danielle Ray, a Paducah Sun staff writer, at 270-575-8657.

Mercy Health Foundation raises record \$95,000+

Staff report

Mercy Health Foundation Lourdes' 19th Annual Charity Golf Open raised more than \$95,000 at the annual event held Monday at the Country Club of Paducah. The tournament hosted 41 teams, with about 200 golfers and volunteers participating.

Funds raised at this year's tournament will support the expansion of the Epilepsy Monitoring Unit at Mercy Health Lourdes. An epilepsy monitoring unit (EMU) is a specialized inpatient unit where patients are admitted for detailed diagnostic evaluation of their seizures and spells. The current two-bed EMU has a waiting list, but the expanded EMU will more than double the current capacity so that patients will not have to wait a long time for this important testing.

"Thank you to everyone who played, sponsored, and volunteered their time to help make our fundraiser a success," says Jessica Toren, Foundation president. "We are proud to support this expansion project to help provide quality healthcare in



City National Bank won first place in the morning flight of the Mercy Health Foundation Lourdes' 19th Annual Charity Golf Open. Team members included Landon Bremer, Jared Quint, Jason Helm and Bryce Hammond.

our region."

"The tournament is one of our Foundation's key public fundraising events and would not happen without the support from our sponsors and donors," says Michael Yungmann, CEO, Kentucky Region, Mercy Health Lourdes Hospital. "The generosity from our donors

continues to be a large part of our tournament's success year after year, allowing us to advance our mission to extend the healing ministry of Jesus by improving the health of our communities."

City National Bank won first place in the morning flight. Team members included Landon Bremer, Jared Quint,



Pinnacle took the first place prize in the afternoon flight of the Mercy Health Foundation Lourdes' 19th Annual Charity Golf Open tournament. Team members included Dennis Smith, Craig Schwettman, Todd Thomas and Preston English.

Jason Helm and Bryce Hammond. Pinnacle took the first place prize in the afternoon. Team members included Dennis Smith, Craig Schwettman, Todd Thomas and Preston English. Caroline Korte was

the lucky recipient of the Master's trip to Augusta, Ga. For more information about Lourdes Foundation call (270) 415-3992 or visit <https://foundation.mercy.com/Paducah>,



University of Kentucky College of Engineering Paducah Campus undergraduate student Shelby Browning (left) and graduate student Chandni Joshi stand with Dr. Jeffrey Seay, associate professor of chemical engineering at the Paducah campus. Browning and Joshi recently took home multiple honors for their research presented at the 7th International Congress on Sustainability Science and Engineering in Cincinnati, Ohio.

UK College of Engineering Paducah Campus students earn awards

Staff report

University of Kentucky College of Engineering Paducah Campus graduate student Chandni Joshi and undergraduate student Shelby Browning recently presented their research at the 7th International Congress on Sustainability Science and Engineering (ICOSSE) in Cincinnati, Ohio. Both students took home multiple honors for their efforts:

■ 1st Place Student Poster Award — Chandni Joshi and Jeffrey Seay (2018): "Novel Approaches to Waste Plastic Management in Developing Countries," 7th International

al Congress on Sustainability Science and Engineering, Cincinnati, Ohio.

■ 1st Place People's Choice Rapid Fire Poster Presentation Award — Chandni Joshi and Jeffrey Seay (2018): "Novel Approaches to Waste Plastic Management in Developing Countries," 7th International Congress on Sustainability Science and Engineering, Cincinnati, Ohio.

■ 2nd Place Student Poster Award — Shelby Browning and Jeffrey Seay (2018): "A Sustainable Approach for Green Pesticide Production in Kenya from the Croton Megalocarpus

Trees," 7th International Congress on Sustainability Science and Engineering, Cincinnati, Ohio.

■ 3rd Place People's Choice Rapid Fire Poster Presentation Award — Shelby Browning and Jeffrey Seay (2018): "A Sustainable Approach for Green Pesticide Production in Kenya from the Croton Megalocarpus Trees," 7th International Congress on Sustainability Science and Engineering, Cincinnati, Ohio.

Out of 24 presenters, Browning was one of two undergraduates to receive awards.

Graves FFA earns awards at state fair

MAYFIELD — Twenty-seven members of the Graves County High School FFA recently competed at the Kentucky State Fair in Louisville. They included Maddie Adam, Madison Brown, Trevor Choat, Evan Darnell, Justin Earles, Mason Fowler, Lane Howell, Zach Lindsey, Sarah Lyell, Alex Macias, Kylie McCormick, Clay Mills, Gracey Moffitt, Sophie Pitts, Karly Prather, Abby Sadler, Shaynah Sanderson, Cody Sims, Clayton Story, Ethan Story, Daniel Travis, Luke Warner, Brandon West, Bailey Whiteman, Blake Williams and Ashley Wyatt.

The Agricultural Mechanics team brought home first place in the state. Team members are Cody Sims, Blake Williams, Zach Lindsey and Clayton Story. They will advance to national competition in October.

The Floriculture team placed second in the state. Team members are Luke Warner, Abby Sadler, Karli Prather

and Gracey Moffitt. Karli Prather had the second highest individual score in the state.

The Junior Dairy team placed second as well. Team members are Maddie Adams, Sarah Lyell, Madison Brown and Ethan Story. Ethan Story was ranked fourth overall individual, and Maddie Adams was sixth overall individual.

The Agronomy team placed sixth in the state. Its members are Evan Darnell, Justin Earles, Mason Fowler and Clay Mills.

The Meats team placed ninth. Members are Ashley Wyatt, Daniel Travis, Sophie Pitts and Brandon West.

The Livestock team placed 13th in the state. Members are Shaynah Sanderson, Kylie McCormick, Trevor Choat and Justin Nall.

The Graves High FFA also brought home the High Point FFA Chapter Award for Green Dark Tobacco exhibits and third Premium Chapter for soybean exhibits.



House of the Month

The home of **Bo and Carol Bell**, 225 Jennifer Lynn Drive, has been chosen as the September House of the Month by the Paducah Civic Beautification Board.

Murray High graduate earns prestigious Spanish scholarship

Staff report

MURRAY — Mallory Woolridge, a 2018 graduate of Murray High School and former student of Spanish teacher Lauren Hines, has received a first place scholarship of \$2,000 through the National Spanish Examinations.

Students become eligible for the scholarship by scoring in either the gold, silver or

Mallory Woolridge is a Murray State University presidential scholar.

bronze categories on the National Spanish Examinations. Students must then submit an application form along with a sample of their Spanish language writing and speaking. Their written and oral proficiencies are evaluated by

a committee.

"Earning a scholarship for any student on the National Spanish Examinations is very prestigious," said Kevin Cessna-Buscemi, national director of the Exams, "because only 12 students are chosen from

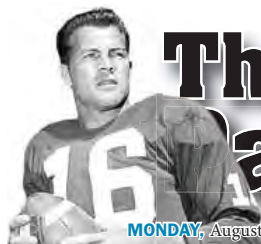
among the 150,000 students who take the National Spanish Exams each year."

Woolridge is a Murray State University presidential scholar.

The National Spanish Examinations are administered each year in grades 6 through 12, and are sponsored by the American Association of Teachers of Spanish and Portuguese.



Woolridge



MONDAY, August 10, 2015

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The Paducah Sun



ELLEN O'NAN | The Sun

Asami Shikida (left) and Naomi Uchida, university professors from Kanazawa, Japan, are in Paducah for a week-long visit gathering information for their research project on biocultural diversity. Kanazawa, like Paducah, is a UNESCO Creative City of Craft & Folk Art.

Japanese researchers studying culture, diversity of Paducah

BY DAVID ZOELLER
dzoeiler@paducahsun.com

While Paducah's UNESCO Creative Cities designation helps locals learn how other cities worldwide combine culture and creativity to build their communities, two Japanese researchers may help Paducah return the favor.

Naomi Uchida, an associate professor with Saitama University's department of social environmental design, and Asami Shikida, a professor with Hokkaido University's Center for Advanced Tourism Studies, are in town for a week-long visit gathering information for their research project on biocultural diversity.

The two researchers worked together for several years at a university in Kanazawa, Japan, which, like Paducah, is a United Nations Educational, Scientific and Cultural Organization Creative City of Craft & Folk Art.

The pair are being treated to a whirlwind tour of the city cour-

"I thought Paducah would be a great city to look at because of the revitalization of downtown and the artist relocation program."

Naomi Uchida

Associate professor with Saitama University

tesy of Executive Director Mary Hammond and the staff of the Paducah Convention & Visitor's Bureau. Their itinerary includes meetings with artists, students, educators, and city and community leaders.

"I tried to find some cities for comparison study, including Santa Fe (New Mexico, the only other Creative City of Craft and Folk Art in the U.S.)," Uchida said.

"I thought Paducah would be a great city to look at because of the revitalization of downtown and the artist relocation program," she said. "When you talk about creative cities and the economy, artists are very,

very important. That's a good engine for boosting the economy."

Uchida noted differences between Santa Fe and Paducah.

"Santa Fe is mostly gentrified," Uchida said. "There are lots of galleries and souvenir shops downtown, and it is an interesting city, architectural style-wise, and also there is a tourism industry."

"But Paducah is more cozy and has a small city atmosphere, which I like. Maybe there will be some gentrification, I don't know, but when I

Please see CULTURE | 10A

Small changes could rescue Social Security

BY STEPHEN OHLEMACHER

Associated Press

WASHINGTON — As Social Security approaches its 80th birthday Friday, the federal government's largest benefit program stands at a pivotal point in its history.

Relatively modest changes to taxes and benefits could still save it for generations of Americans to come, but Congress must act quickly, and even limited changes are politically difficult.

The longer lawmakers wait, the harder it will become to maintain Social Security as a program that pays for itself, a key feature since President Franklin Roosevelt signed the Social Security Act on Aug. 14, 1935.

"The more time that they take, the less acceptable the changes will be because there needs to be adequate time for the public to prepare and to adjust to whatever changes Congress will make," Carolyn Colvin, acting commissioner of the Social Security Administration, said in an interview.

Social Security's long-term financial problems are largely a result of demographic changes. As baby boomers swell the ranks of retirees, relatively fewer workers are left to pay taxes.

In 1960, there were more than five workers for every person receiving Social Security. Today there are fewer

Please see CHANGES | 10A

Station to open more hamburger restaurants

BY LILLY BURBA

lburba@paducahsun.com

By this fall, the Station Burger Company expects to open its fifth location in as many years, and owner Carl Medlin sees it growing more from there.

"We've gotten interest in opening up these restaurants in many other cities in Kentucky, and even as far away as Florida," Medlin said.

The first Station Burger opened in 2010 near the Kentucky Oaks Mall in Paducah. Currently there are three locations open: two in Paducah (the second on the south side) and one in Murray. The next to open will be in Union City, Tennessee, and that will be followed by one at the Eddyville Mall.

The Union City location, which is scheduled to open within the next week if all goes as planned, will be the first franchise location. The menu will be identical, as will the comfortable atmosphere.

At all of the Station Burger restaurants, portraits of local first responders hang on the walls to honor these life-sav-

Please see STATION | 10A

UK students from Paducah make a difference in India

BY MALLORY PANUSKA

mpanuska@paducahsun.com

A dozen Paducah engineering students spent six weeks this summer showing people in an underdeveloped region of India that they could make money and rid the area of unwanted waste by simply starting a fire.

The trip was a leg of the University of Kentucky College of Engineering Paducah Campus' global learning program and one of several trips students have taken to under-

developed regions in the past several years.

Jeffrey Seay, associate professor of chemical engineering at the college, formed a team of 12 chemical and mechanical engineering students to travel to India this year and carry out research on sustainable energy and agriculture.

In Tirachuli, the team worked with the Organization for Development Action and Maintenance to convert waste



Submitted photo

Jeffrey Seay, associate professor of chemical engineering at the University of Kentucky College of Engineering Paducah Campus, talks with reporters in India about the research he and his team of 12 students were carrying out on sustainable energy and agriculture in the region.

Please see INDIA | 9A

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ADVICE

From our Local Professionals

Terri Lundberg

Donnie Baker

NEXT WEEK:

MILNER & ORR

Iraqi Christians who fled IS living in limbo

BY KARIN LAUB
Associated Press

FUHEIS, Jordan — A year after tens of thousands of Iraqi Christians fled communities overtaken by Islamic State militants, their lives are on hold in exile: They won't go back to Iraq, saying it's not safe for Christians, but as refugees they're barred from working in temporary asylum countries such as Jordan. Expectations of quick resettlement to the West have been dashed.

"We've lost hope in

everything," said Hinda Ablahat, a 67-year-old widow who lives with dozens of fellow refugees in plywood cubicles set up in a church compound in downtown Amman, the capital of Jordan.

"We've been sitting here for a year and nothing's happened."

About 7,000 Christians from northern Iraq have found refuge in Jordan, including about 2,000 living in church-sponsored shelters.

On Saturday evening, Patriarch Louis Sako of

Iraq's Chaldean Catholic Church and Jerusalem-based Latin Patriarch Fouad Twal led hundreds of worshippers in an outdoor prayer service in the town of Fuheis, near Amman, to mark a year since the Iraqi Christians' displacement.

The service included a message of encouragement from Pope Francis, saying he is appealing for solidarity with those victimized by fanaticism and intolerance, "often under the eyes and in the silence of all." The

church "does not forget and does not abandon her children who have been exiled on account of their faith," read the message, first published late last week.

The words rang hollow to some in the crowd.

"Everyone has forgotten us," said Johnny al-Behno, 25, standing in the back with friends. Al-Behno holds an engineering degree, but is forced to live off dwindling savings because of the ban on working.

Jordan struggles with high unemployment

and says it cannot afford to integrate hundreds of thousands of Syrian and Iraqi refugees into the labor force.

The Christian exodus began a year ago when Islamic State militants swept across northern Iraq, targeting indigenous religious minorities.

Bahnman Atallah, 47, said he and his family fled their hometown of Qaraqosh, near Mosul, on Aug. 6, 2014.

Islamic State had been shelling the town all day, Atallah said. The fam-

ily of six fled for safety at nightfall to Erbil, the capital of the Kurdish region, with just two small duffel bags holding clothes, passports and family photos.

The drive normally takes less than an hour, but thousands were fleeing and the Atallahs only arrived in Erbil after midnight.

Now home for Atallah, his wife Jinan, and their children Eldier, Sarah and Maryam is a church shelter in Amman they share with 60 other refugees.

INDIA

CONTINUED FROM 1A

plastic into fuel and extract organic pest repellent, using a noxious weed that grows abundantly in the region.

"The fuel oil process is really important," said sophomore mechanical engineering student John Higgins. "It could probably change the face of the landscape over there."

Higgins and the other students said the conditions in the region they visited were harsh, with trash lining nearly all of the streets and foul smells permeating the air. The technology the students introduced to the people could not only help them improve their landscape conditions, but the overall economy, Higgins said. "It's something that can make a lot of money for the people," he said. "It's



Students from the University of Kentucky College of Engineering Paducah Campus work on filling one of the processors they used to perform research on sustainable energy and agriculture during a six-week trip to India this summer through the college's global learning program.

a very basic process, you just have to maintain a fire."

The fuel produced from the process can be used in everything from diesel motors to cook-

ing and heating to generators. Junior chemical engineering student Chandni Joshi added that the fuel runs 75 percent longer than regular fuel, which she said adds

significantly to its marketability.

The trip came on the heels of two trips Seay and other groups of students took to Cameroon in 2012 and 2014. More

overseas research journeys will follow.

"We had a lot of fun, and it was a lot of work," Seay said of the India trip.

"It was very well-received. I think it will be the beginning of a long-running partnership."

He cited the benefits not only to the Indian people, but also to the students themselves.

All from Paducah, some of the students had never even been on an airplane before the

trip, Seay said. Now they have experience not only flying but obtaining passports, navigating through customs and working with a very different culture of people. He said that will help all of them significantly when they compete in the global market for employment when they graduate.

"This is really a chance for them to experience the world from right here on our campus," he said.

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MALLORY PANUSKA | The Sun

Celebrating Advent

Scott Jones, a St. Francis de Sales Catholic Church congregation member, leads a line of parishioners from local churches Sunday up Broadway from St. Francis to Grace Episcopal Church during Paducah's annual downtown Advent walk. Five downtown churches — St. Francis, Grace Episcopal, First Presbyterian, United Methodist and Washington Street Baptist — participated in the walk celebrating the start of the Christmas season and Christian year.

\$3.58 million in new grants to help more needy students

BY GENEVIEVE POSTLETHWAIT

gpostlethwait@paducahsun.com
Murray State's Dr. Doris Clark-Sarr is a big believer in the power of the U.S. Department of Education's TRIO programs because she's seen them work. TRIO programs assist low-income individuals, first-gen-

eration college students, and individuals with disabilities progress through the academic pipeline from middle school to post-graduate programs. Until recently, Clark-Sarr and Murray State's TRIO team were able to offer spots in the program to only 162 kids at a time. Now they'll be able to open

the program to 1,000 more kids and 1,000 adults, thanks to three TRIO grants she recently secured. The grants will bring an additional \$3.58 million into MSU's TRIO program over the next five years. "We want to get as many people as we can in this program,

Please see **TRIO** | 6A

Trump claims 'millions' cast votes illegally

BY STEVE PEOPLES AND CALVIN WOODWARD

Associated Press

NEW YORK — President-elect Donald Trump claimed without evidence Sunday that "millions" voted illegally in the national election, scoffing at Hillary Clinton's nearly 2 million edge in the popular vote and returning to his campaign mantra of a rigged race even as he prepares to enter the White House in less than two months.

Trump and his lieutenants assailed an effort — now joined by Clinton — to recount votes in up to three battleground states, calling the push fraudulent, the work of "crybabies" and, in Trump's estimation, "sad."

The president-elect himself launched a Twitter offensive that spanned more than 12 hours on Sunday, casting a shadow over the legitimacy of an election that he actually won.

"I won the popular vote if you deduct the millions of people who voted illegally," he tweeted in the afternoon before alleging in an evening tweet "serious voter fraud in Virginia, New Hampshire and California." Trump's transition team did not respond to questions seeking evidence of the unfounded claims.

There's been no indication of widespread vote manipulation, illegal voting or hacking that materially affected the outcome one way or the other. It's that very lack of evidence that suggests Trump is likely to prevail in recounts.

Trump on Sunday tweeted part of Clinton's concession speech, when she told supporters they must accept that "Donald Trump is going to be our president," and snippets from her debate remarks, when she denounced the Republican nominee for refusing to say in advance

Please see **VOTES** | 6A

U.S.-Cuba relations face uncertain future

BY BRADLEY KLAPPER

Associated Press

WASHINGTON — Fidel Castro's passing removes what was long the single greatest psychological barrier to a warmer U.S.-Cuba relationship. But it also adds to the uncertainty ahead with the transition from an Obama to a Trump administration.

"A brutal dictator" of a "totalitarian island," declared President-elect Donald Trump, underscoring the historical trauma still separating the countries.

A more restrained President Barack Obama, carefully promoting and working to preserve his own attempt to rebuild those ties, said history would assess Castro's impact and that the Cuban people could reflect "with powerful emotions" about how their longtime leader influenced their country.

In death as in life, Castro has divided opinion: a revolutionary who stood up to American aggression or a ruthless dictator whose movement trampled human rights and democratic aspirations.

President Raul Castro, Fidel's younger brother, is 85.

Please see **UNCERTAIN** | 6A



GENEVIEVE POSTLETHWAIT | The Sun
Amiya Jones, a Paducah Tilghman High School senior, is the Paducah Bank Teen of the Week.

ROTC plays key role in Tilghman teen's success

BY GENEVIEVE POSTLETHWAIT

gpostlethwait@paducahsun.com
When Amiya Jones was in middle school, a friend started telling her about Paducah Tilghman's Naval Junior Reserves Officer Training Corps, encouraging her to join.

She was skeptical. She didn't really have much interest in the military. But when she got to Tilghman, she gave the NJROTC a chance, and boy is she glad she



did. "It's been a great program for me," she said. "I just love it. ROTC helps me through everything."

Please see **TEEN** | 6A

Paducah engineering student seeks to aid developing nations

BY MASON BLANFORD

mblanford@paducahsun.com
Upon returning to her native India, Chandni Joshi was relieved to see the waste dump once behind her village was gone. "Just now India is getting recycling technology in more developed regions and ways to manage that (waste)," said Joshi, 21, who now lives in Paducah. "But in

other places, that problem still exists." A University of Kentucky senior studying chemical engineering, Joshi researches solutions for waste accumulation in developing countries. She is the lead student member of her school's Appropriate

Please see **JOSHI** | 6A



Chandni Joshi visited Suzhou, China, in October 2015, accompanied by Dr. Jeffrey Seay, associate professor of chemical engineering at the UK College of Engineering in Paducah. There she won first place in two competitions hosted by the International Congress of Science Sustainability and Engineering.

Contributed photo

REGION

EARLY SIGNS OF WATER WOES

Though water shortages have yet to drastically change most people's lifestyles, Southerners are starting to realize they'll need to save their drinking supplies with no end in sight to an eight-month drought.

3A



WORLD

GONZALEZ RE-EMERGES TO PRAISE CASTRO

Elian Gonzalez, the center of a dramatic custody battle waged by Fidel Castro nearly two decades ago, returned to the public eye Sunday to praise the leader who fought to return him to Cuba.

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JOSHI

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Technology and Sustainability research team, located at the UK College of Engineering's Paducah campus at West Kentucky Community & Technical College.

Joshi has been in 11 competitions for student research, placing first or second in eight of them. Her most recent award came in November at a Sustainable Engineering Forum in San Francisco, where she presented her summer 2016 project that focused on converting coal and biomass for transportation fuels in Kentucky.

In August, her work on low-cost methods for converting plastic waste to fuel was published in the "Journal of Sustainable Development." The research is designed to benefit developing regions of countries like India, she said.

"There are a lot of real-world applications to what we do in class," Joshi said. "Applying this to everyday real-world things is what makes it interesting."

UK and WKCTC have provided scholarships and grants for her work, along with organizations like the MGM Charitable Foundation and Lourdes hospital in Paducah.

Joshi's research has taken her to places like Uganda, Gabon and Cameroon. Part of her job has been to work with non-governmental organizations abroad, teaching them how technology can help reduce waste accumulation.

She's been invited to several conferences with NGOs and other universities to discuss her work. Although Joshi said she loves to travel, she noted Paducah was a culture shock when emigrating from India at 11 years old.

"Growing up in India, Paducah was a new culture, too," she said. "But I'm happy to go and see and experience

new cultures. Some countries I've visited have been very Westernized, and some have been developing."

Some of her experiences abroad, she said, have lent new perspective, such as sharing a small guesthouse in Cameroon with a dozen other students. During a sustainability project there with an African-based NGO, she helped generate wood vinegar as a non-synthetic pesticide from leftover farming crops to assist rural agriculture.

"Getting to experience those kinds of different things also gives a humbling tone to you," she said. "It makes you

realize that all these materialistic things aren't what is important."

For developing countries, Joshi hopes to eliminate the "piles of waste behind villages" she's encountered. Her goal is to earn a doctorate in chemical engineering and work on sustainability in these communities or through a business of her own.

"Growing up, I've seen the poverty," she said. "Seeing how engineering can impact real-life problems has helped me see how this technology can help others emerge from poverty and (improve) their standards of living."

UNCERTAIN

CONTINUED FROM 1A

Their Communist Party shows no signs of opening up greater political space despite agreeing with the United States to re-establish embassies and facilitate greater trade and investment.

As Obama leaves office in January, his decision to engage rather than pressure Havana in the hopes of forging new bonds could quickly unravel. Trump has hardly championed the effort and Republican leaders in Congress fiercely opposed Obama's calls to end the 55-year-old U.S. trade embargo of the island.

"We know that this moment fills Cubans — in Cuba and in the United States — with powerful emotions, recalling the countless ways in which Fidel Castro altered the course of individual lives, families and of the Cuban nation," Obama said.

He offered neither condemnation nor praise for Castro, who outlasted invasion and assassination plots, and presided over the Cuban missile crisis, which took the world to the brink of nuclear war.

"History will record and judge the enormous impact of this singular figure on the people and world around him," Obama said, adding that U.S.-Cuban relations shouldn't be defined "by our differences but by the many things that we share as neighbors and friends."

Trump didn't pass off his evaluation to the historians.

"Today, the world marks the passing of a brutal dictator who oppressed his own people for nearly six decades," Trump said in a statement. "Fidel Castro's legacy is one of firing squads, theft, unimaginable suffering, poverty and the denial of fundamental human rights."

Trump expressed hope that Castro's death would mark a "move away from the horrors" toward a future where Cubans live in freedom. But he said nothing about Obama's project to reset ties, and even hailed the election support he received from veterans of the failed 1961 Bay of Pigs invasion that was backed by the CIA.

Such a statement probably will irritate Havana, coming after a two-year period of intense diplomatic discussions with Washington that have done more to improve relations between the countries than anything in the past 5½ decades.

Trump "is going to be looking for some movement in the right direction in order to have any sort of deal with Cuba," his incoming chief of staff, Reince Priebus, told "Fox News Sunday." And without that, Priebus said Trump "absolutely" would reverse Obama's opening with Havana.

Castro's reign began when his improbable insurrection ousted the U.S.-backed strongman Fulgenio Batista in 1959. Only 32 at the time, Castro was the youngest leader in Latin America and inspired revolutionaries as far afield as Africa and Asia.

But Castro's socialist Cuba was anything but an idyll, and the United States quickly became his fiercest opponent.

Members of Batista's government went before summary courts, with at least 582 executed by firing squad in the first two years of Castro's rule. Independent newspapers were closed. Gays were herded into camps for "re-education." Tens of thousands were held as political prisoners.

TEEN

CONTINUED FROM 1A

Four years into the program, Jones has worked her way through the ranks to earn her official title as executive officer and unofficial title as "ROTC queen." She's gone from being a shy cadet who struggled with low self-esteem to a confident young woman who takes pride in setting a good example for others.

"I love that they call me ROTC mom or ROTC queen. I take it seriously," she said.

"I just want others to feel like, you can be me one day. You can grow up and be a great leader. I want to be a positive influence on people. I want to be a role model for my brothers and sis-

ters, the people younger than me, to show them that you can be whoever you want to be in life. All you have to do is push yourself."

Jones has certainly pushed herself through her high school years, and she intends to keep on pushing.

She has her sites set on attending George Washington University in Washington D.C., next fall to study psychology, biochemistry or social work. Austin Peay is her second choice, and she's already been accepted there.

Regardless of where she goes, she will continue with the ROTC and enlist in either the U.S. Navy or Air Force after graduation.

Jones, daughter of

VOTES

CONTINUED FROM 1A

that he would accept the Election Day verdict.

This came on top of his saying it was a "scam" that Green Party nominee Jill Stein was even revisiting the vote count in the states of Wisconsin, Michigan and Pennsylvania. Trump won Wisconsin and Pennsylvania, and as of Wednesday, held a lead of almost 11,000 votes in Michigan, with the results awaiting state certification Monday.

Trump's Michigan

margin was a hair's breadth 0.22 percent of the state's votes.

Clinton leads the national popular vote by close to 2 million votes, but Trump won 290 electoral votes to Clinton's 232, not counting Michigan. She could conceivably tip the electoral balance in the remote event that all flipped to her in recounts.

Trump returned to New York Sunday evening after spending Thanksgiving weekend at his West Palm Beach

estate.

His transition team said the president-elect had scheduled a series of meetings Monday with prospective administration hires.

Among the jobs Trump has still yet to fill: secretary of state. Internal division over the position again spilled out into the open on Sunday as Trump senior adviser Kellyanne Conway voiced her concerns with the possibility of Romney landing such a significant position.

Trump supporters

"feel a bit betrayed that you can get a Romney back in there after everything he did," Conway said. "We don't even know if he voted for Donald Trump. He and his consultants were nothing but awful to Donald Trump for a year." She added that she was "reflecting what the grassroots are saying."

Former New York City Mayor Rudy Giuliani and Tennessee Sen. Bob Corker are among other prospects to serve as the country's top diplomat.

TRIO

CONTINUED FROM 1A

because TRIO works," Clark-Sarr said.

"I believe in it. I've seen it. We're doing something right. I've seen so many kids finish school and go on to be teachers, lawyers, doctors.



Clark-Sarr

These are kids whose parents or siblings just might not have the knowledge to help them with their schoolwork or scholarship applications or the whole college process. We help them get through it all."

Clark-Sarr secured two Educational Talent Search grants, one targeting students in Kentucky and the other Missouri.

Each grant will provide tutoring, exam prep, admissions assistance, financial aid advising, personal and career counseling, cultural experiences and more for 500 sixth- to 12th-graders at a time. This will be in addition

to the 162 kids currently served through two Adventures in Math and Science grants, another grant offered under the TRIO umbrella.

The spots will be reserved for students from schools with high percentages of low-income students. In Kentucky, that includes Christian County High School, Fulton County High School, Fulton City High School, Hickman County High School and Mayfield High School.

Clark-Sarr also secured an Educational Opportunity Center grant which works with low-income adults — often parents of kids in the TRIO program — to further their education. The EOC program helps participants with passing the GED, test prep, college admissions, scholarship and financial aid applications, financial literacy and career exploration, among other things.

Once EOC participants achieve their goal, be it earning their GED or an undergraduate degree, their spots open up allowing others to take advantage of the program. There's a running

waitlist for TRIO programs, Clark-Sarr said, because they want to keep every spot filled. These programs are so effective, she said, that an empty spot is a terrible waste.

Clark-Sarr is thrilled to be able to serve so many more individuals over the next five years. The need is serious, she said. "When it's 2016 and you have adults who do not have a high school diploma, that's serious," she said. "I've been saying this since the early '90s when I started working with these programs. You'd think in 2016, almost 30 years later, there would be a different scene, but it's the same."

Clark-Sarr said one of the most powerful pieces of TRIO programs is the exposure participants get to the world outside their home communities. So often kids who are new to the program have never been out of their neighborhood. They've never been in an elevator or on an escalator. They've never seen a college.

She remembers the first time she took a

group of TRIO students to Patti's 1880's Settlement for a celebratory dinner. She ordered appetizers for the table, including an order of peel-and-eat shrimp.

The food came, and the kids chowed down happily. She looked around and saw nothing left. Not a shrimp shell nor tail. They ate it all. A few of the kids had never even seen shrimp before, she realized.

"Somebody who didn't know better might laugh, and we did laugh together about it later, but that was a teachable moment," she said.

"Imagine, if you've never done these little things, if you don't know how to peel and eat a shrimp, or getting on an escalator scares you to death, imagine trying to apply to college. You hear college is going to cost \$20,000. What do you do? You think, I can't afford that, and you don't even try. You don't know about financial aid and scholarships. It's overwhelming. But I tell them, it's like eating an elephant. You just have to do it one bite at a time."

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Super Senior 9 holes (75) \$465	Golf cart (18 holes) \$750 or \$66/mo.
Family \$1,250	

monthly rates:

Individual **\$79/mo.** • Seniors **\$74/mo.** • Families **\$109/mo.**

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Lola Jones of Paducah, is the Paducah Bank Teen of the Week. Each Monday, The Sun features a different teen selected from nominees submitted by school counselors across western Kentucky and southern Illinois. A Teen of the Year will be chosen from the weekly winners and receive a \$2,500 scholarship.

For now, Jones has a busy final semester of high school ahead. In addition to her ROTC activities and coursework, she is juggling Advanced Placement and honors classes, track, community service activities and a part-time job waiting tables at IHOP. She's earned a near-perfect grade-point average, a 3.82.

Hers is an intense schedule, but she enjoys it. She can't talk about ROTC, school or even her job at IHOP without smiling. She's proud of what she's accomplished and grateful for her teachers, family and friends who have encouraged and supported her along the way.

"I thank God every day for these people who help me in my life," she said.

"I'm just so thankful that I'm alive and that I get to do the things that I do. To be honest, sometimes I don't know how I juggle everything. I just focus. My mind is set. All I have to do is keep pushing myself and focus on achieving my goals and getting where I want to be in life."

The Lineup

Today

Papermill Retirees, Spouses, and Friends, 8:30 a.m., The Parlor in Lone Oak. 554-3492.

Disabled American Veterans, Miles Meredith Chapter 7 of Paducah, weekly Commander Coffee Call, 8 a.m. to noon. Service officer available.

McCracken County Genealogical & Historical Society, 1:30 p.m., McCracken County Public Library. 270-554-0878.

Thursday

Senior Medicare Patrol, 8 a.m.-4 p.m., 1400 H.C. Mathis Drive. Learn to detect potential Medicare errors, fraud and abuse. Report errors or suspected fraud to SMP. 442-8993.

Paducah Gaseous Diffusion Plant retirees and spouses, 11:45 a.m., Lone Oak Little Castle. 442-8332.

Downtown Kiwanis Club, lunch, noon, Igert Hall at Broadway United Methodist Church.

Esther Chapter Five Order of the Eastern Star, 6 p.m., 2340 Jackson St. 554-5076.

Paducah Citizens Police Academy alumni, 6:30 p.m., Kentucky Oaks Mall Community Room.

Sons of Confederate Veterans, Gen. Lloyd Tilghman Camp No. 1495, 7 p.m., upstairs, Gen. Lloyd Tilghman Home and Civil War Museum. 443-4237.

South Paducah Kiwanis, 6:30 p.m. 1640 S. 6th St., Paducah. Jay English, 270-243-0392, or Tom Emerson Sr., 270-444-6413.

Dance, 7-10 p.m., Traders Mall, 6900 Benton Road, Reidland. Band: Due South. \$5.

McCracken County Amateur Radio Emergency Services, 7 p.m., West Kentucky Navigation, 631 Marine Way.

Vietnam Veterans of America, 7 p.m., DAV building, Paducah.

Items for the Lineup must be received in writing five days in advance. Mail to: Lineup, The Paducah Sun, P.O. Box 2300, Paducah, KY 42002-2300; fax the newsroom at 442-7859; or email news@paducahsun.com. Announcements are published day of event. Information: 575-8677.

Tuesday's lottery

Kentucky

Pick 3-midday: 5-7-5
Pick 3-evening: 6-8-9
Pick 4-midday: 4-9-4-1
Pick 4-evening: 2-5-3-8
Cash Ball: 1-2-7-17 **CB** 12
Cash Ball Kicker: 3-3-6-6-1
5 Card Cash: JD-3S-2C-2D-4C
Mega Millions: 37-46-48-70-74 **MB** 1
Megaplier 2
 Numbers are unofficial.
 Website: www.kylottery.com
 Lottery headquarters (Louisville)
 502-560-1500
 Regional Office (Madisonville)
 270-825-0205

Illinois

Pick 3-midday: 6-6-6 **FB** 8
Pick 3-evening: 5-4-3 **FB** 7
Pick 4-midday: 2-0-8-1 **FB** 1
Pick 4-evening: 2-7-3-1 **FB** 9
My 3-midday: 6-8-6
My 3-evening: 1-7-0
Lucky Day Lotto-midday: 11-20-23-28-31
Lucky Day Lotto-evening: 10-11-16-20-28
 Website: www.illinoislottery.com
 800-252-1775
 Outside Illinois: 217-524-5156

Old Ledbetter bridge drops again

BY DAVID ZOELLER
 dzoeller@paducahsun.com

The west approach spans on the old Ledbetter bridge have dropped another couple of inches because of recent rain, and Kentucky Transportation Cabinet officials continue to closely monitor the situation with more rain expected.

The approach spans shifted 2.25 inches in the past couple of days, an indication the moving hillside is continuing to shift the land piers supporting the approaches at the west end of the bridge, according to Keith Todd, cabinet spokesman.

"We've only had an inch or so of rain," Todd said Tuesday afternoon, noting the 80 percent chance of additional rain forecast into today. "The more rain

we have the more concerned we are."

The 83-year-old bridge, which spans the Tennessee River from McCracken to Livingston counties, has dropped more than 5 feet since April 30. The bridge closed last July when the new \$66 million Ledbetter bridge opened upstream.

According to Todd, the west approach spans are being checked several times a day.

While an earlier assessment indicated a collapse of the approach spans is not likely to affect the main bridge spans, District 1 Chief Engineer Mike McGregor said the latest movement has prompted engineers to take additional precautions. Those include urging the public to avoid areas beneath the ap-

proach spans, and the planned placing of solar-powered navigation lights on the main truss spans and piers in case power to the existing lights should be cut by an additional drop.

"We'd like to emphasize the need for people to stay out from under the bridge," Todd said. "We've been told there are Facebook pictures of people under the bridge, and we don't need that. That's not a good place to be. And, with all this rain, it wouldn't be a good idea to do any hiking down there either."

Transportation officials have been in regular communication with the U.S. Coast Guard and McCracken County Emergency Management about the bridge and land slippage.

According to McCracken

County Emergency Management Director Jerome Mansfield, no evacuation of homes along the bluff has been ordered. Residents have been alerted to the land slippage and encouraged to report anything unusual that might indicate additional movement of land along the bluff.

Sheriff Jon Hayden and deputies have placed caution tape along the shoreline to keep people away from the slumping approach spans and leaning piers.

Transportation Cabinet officials continue negotiations aimed at expediting demolition of the bridge, according to Todd.

Contact David Zoeller, a Paducah Sun staff writer, at 270-575-8676.



CARRIE DILLARD | The Sun

'Proper Princess'

Sophia Harris, fifth grader, and Maria Russell, third grader, place their order with Olive Garden server Danielle Mathews. Heath Elementary students in the "Proper Princess" club, a part of the 21st Century program, showed they know how to mind their manners Tuesday as they attend an end-of-the-year party at Olive Garden. The after-school club focuses on teaching table manners and social etiquette to kindergarten through fifth grades.

JPEC warns customers of phone scam

Staff report

Jackson Purchase Energy Cooperative warned Tuesday about an apparent telephone scam in which members are told that their power will be disconnected.

During the phone call, an unidentified caller tells a JPEC member the power will be disconnected within the next hour for non-payment because of problems with the past three payments. The caller tells the member to send \$998 to avoid

having the power disconnected.

About an hour later there is another call, in which the caller says he will settle for \$500 and asks the member to go to CVS and buy a Green Dot prepaid card. The member is further instructed to call 1-800-881-4237 and give the card's access code so the caller can receive the cash payment.

JPEC President and CEO Kelly Nuckols advised JPEC members to protect private details

such as Social Security numbers, banking information and dates of birth.

"We encourage our members to safeguard their personal information and never follow instructions like this from callers asking you to purchase cash cards for payments," Nuckols said.

Utility spokeswoman Izell White said JPEC members are urged to contact the utility at 270-441-0814 immediately if they receive such a phone call.

Dunkin' Donuts construction project begins

Staff report

Plans to construct two Dunkin' Donuts locations in Paducah are continuing.

Permits were received last week for the Dunkin' Donuts at the corner of Lone Oak Road and Jackson Street, according to Scott Morris, director of development for Tasco Properties. Construction on the 1,800

square-foot, free-standing structure is expected to be completed in three to four months.

The second Dunkin' Donuts is planned for a retail center under construction at 2781 West Park Drive, Morris said. The 17,000 square-foot center is being built in two phases. The first phase, which will house a Firehouse Subs and a Pancheros Mexican

Grill, has been completed, according to Morris, with the secured tenants opening for business in the next few months. The Dunkin' Donuts will be included in the second phase, which is expected to be completed in January.

There are additional spaces available for lease in that phase, he said.

Mayor visiting Gabon

Staff report

Paducah Mayor Gayle Kaler, UK Paducah engineering faculty member Jeffrey Seay, and chemical engineering undergraduate research student Chandni Joshi are taking the story of Paducah to the sub-Saharan African country of Gabon.

The group plans to discuss economic development

opportunities between Kentucky and Gabon as well as potential research and collaboration



Kaler

opportunities for the University of Kentucky in Gabon.

The group left for Libreville, Gabon, on Tuesday. Upon arrival, they will travel by motorcade to Lambaréné, where they will meet the governor of the Moyen-Ogooué province and the city's mayor. Seay will give a presentation covering the research capabilities at the UK Paducah campus plus an overview of the ongoing research work in Cameroon. Kaler will discuss the economic and cultural exchange opportunities available with Paducah.

"This opportunity has grown out of our ongoing research in sustainable biofuels in Cameroon — the country to the north of Gabon. Through the relationships we have built in Cameroon, we now have the chance to disseminate our work to other countries in the region," Seay said.

"I'm honored to be invited by the University of Kentucky to travel to Gabon, and I am extremely thankful that an anonymous donor is providing the funds for my airfare," said Kaler. "My hope is that this visit will be the beginning of a long-standing cultural, economic

Please see **MAYOR** | 3A

Coming Up ...

THURSDAY



Entertainment news from around the region.

Current

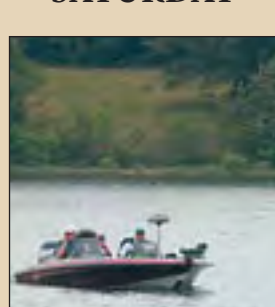
News from the local church communities.

Faith



FRIDAY

SATURDAY

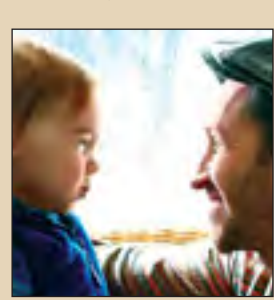


What's happening in the great outdoors?

Outdoors

Stories that offer a personal touch.

Life & Leisure



SUNDAY

MONDAY



See promotions and accolades in the local business community.

People & Business

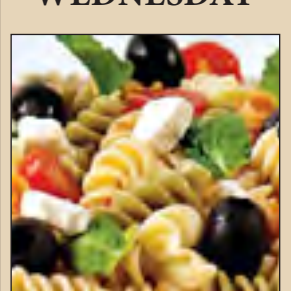
Current events of interest to youngsters.

The Mini Page



TUESDAY

WEDNESDAY



Get the delicious details on all things edible.

Taste

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Local/Region Briefs

Ex-caregiver charged with reckless homicide

A Paducah man has been arraigned on a reckless homicide charge as a result of an investigation by Attorney General Jack Conway's Medicaid Fraud and Abuse Control Unit.

Alan Warner, 53, is a former caregiver at a Community Alternatives Medicaid-funded facility in Hickory. In 2012 Warner is alleged to have acted recklessly in failing to follow his training and improperly treating a resident who had lost consciousness, resulting in the resident's eventual death.

A Graves County grand jury indicted Warner on April 10, and he was arraigned in Graves Circuit Court on Monday.

Warner's case will be prosecuted by Conway's Medicaid Control and Abuse Unit. If convicted, Warner faces up to five years in prison.

— Staff report

Worker fired after double voting discovered

NASHVILLE, Tenn. — A Davidson County election worker has been fired after problems with electronic poll books allowed some people to vote twice.

Election Commissioner Tricia Herzfeld wrote a letter to the elections administrator saying that in addition to double voting, there also have been reports of lost voting records and voters being turned away. Unless those issues are addressed, Herzfeld has said she could vote not to certify the election results at the May 19 commission meeting.

Election officials have said that some people were allowed to vote twice because an outside vendor did not update electronic poll books with the names of early voters before Election Day. The fired Davidson County worker failed to cross-check early voting tallies against the poll books.

Herzfeld also complained that election officials did not want to make the problems public.

— Associated Press

Harlan police to watch vacationers' homes

HARLAN — Harlan County police are trying to help residents enjoy their summer vacations by giving them a little extra peace of mind. The police department has started offering a service in which officers will keep an eye on homes while residents are vacationing.

Sgt. Matt Cope said all people have to do to sign up for the service is fill out a form. Officers will also be able to give out security tips.

Cope said with the service, all officers will know who is out of town so they'll be able to keep a closer watch on empty homes.

He said he hopes the service will cut down on the number of items stolen over the summer.

— Associated Press

LG&E to sponsor riverboat festival in fall

LOUISVILLE — Louisville Gas & Electric has agreed to be the principal sponsor of a riverboat festival being held this fall to celebrate the 100th anniversary of the first launch of the riverboat now known as the Belle of Louisville.

Last month, state officials cut more than \$400,000 from the Waterfront Development Corp. budget. The agency considered cutting parts of the planned Belle celebration.

The agency's special events coordinator, Ashley Smith, said Monday that the budget for the Oct. 14-19 event remains around \$1.2 million.

— Associated Press

MAYOR

CONTINUED FROM 2A

and educational partnership between Paducah and Lambaréné."

Kaler will visit several schools in Lambaréné and present them with McCracken County High School and Paducah Tilghman High School shirts in addition to books donated by McNabb Elementary and local residents.

Following the presentations by Kaler and Seay, the group will tour several of Gabon's cultural landmarks. In addition to observing a traditional ceremony at a Bwiti temple, they will visit the Albert Schweitzer Hospital, the State School for the Deaf and Mute, the National School of Waters and Forests, and more. The contingent will also meet the president of the Gabonese Senate, vice president of the National Assembly and the U.S. ambassador to Gabon.

"This trip is an amazing opportunity for the UK Paducah campus and especially for our students. We are looking forward to the chance to build new relationships and experience the richness of the Gabonese culture," Seay said.

The trip will end Friday, but Seay and Joshi will

then connect with a group of UK engineering students studying in Cameroon. The University of Kentucky Appropriate Technology and Sustainability (UKATS) Research Group, headed by Seay, has been working on low-cost, locally produced biodiesel and bio-char projects since 2011.

The UKATS group has developed these projects in partnership with the African Centre for Renewable Energy & Sustainable Technology (ACREST), located in the village of Bangang in rural Cameroon. This will be the group's second visit to Bangang since 2012.

Ask for details.

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Students research soybeans' potential

BY REBECCA FELDHAUS
 rfeldhaus@paducahsun.com

More local high school and college students are visiting Washington, D.C. This time it's students from the University of Kentucky College of Engineering extension campus and a handful of Lone Oak High School students.

Students and their faculty mentors left Thursday to arrive for their weekend competition in the Environmental Protection Agency's People, Prosperity and the Planet (P3) design competition.

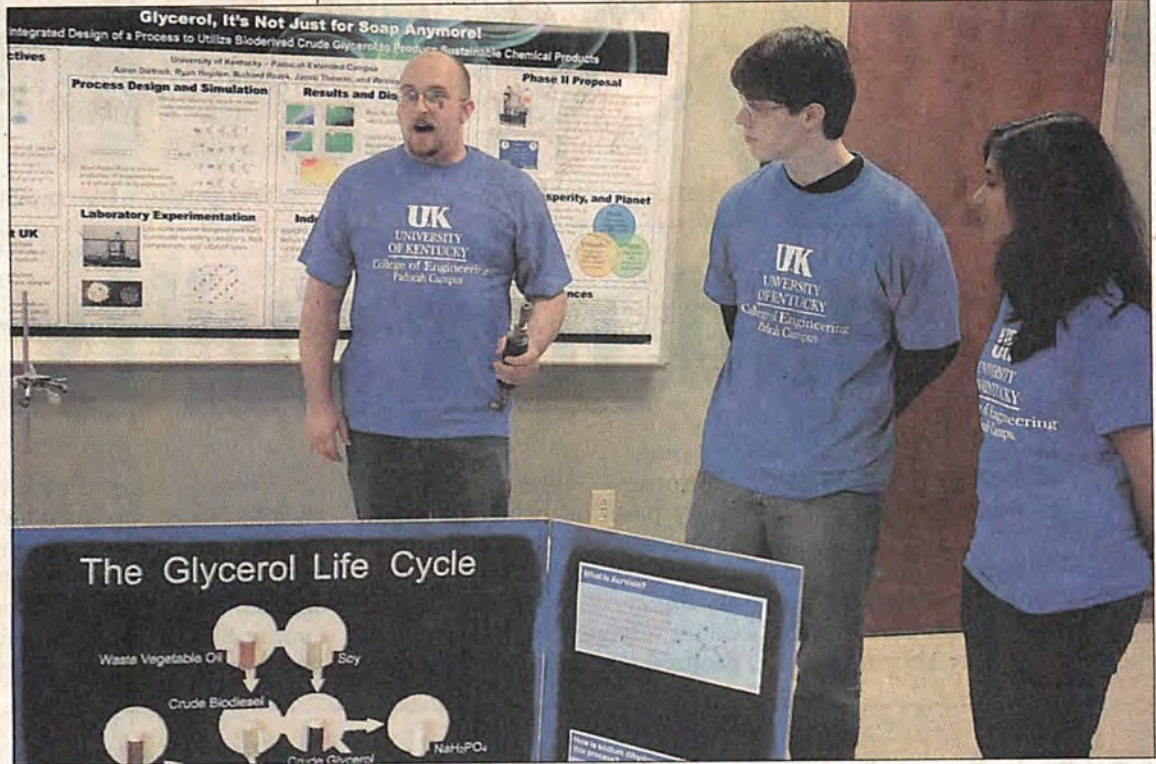
Jeffrey Seay and Charles Lu, both with UK, are the mentors with the project. The students applied for and received a grant of \$10,000 to start their research, Seay said.

According to Seay, UK wanted to promote its outreach program and invited select Lone Oak AP Chemistry students to assist their study. Not only did they receive additional researchers, but also research material in the form of used vegetable oil. It's the crux of their research.

The students have been studying the ability to take glycerol, a side product of using biodiesel, and processing it, Seay said. Once processed, the glycerol is a viable precursor for acrylic acid, which is marketable for plastic production, according to Seay. Currently, he said, the U.S. depends on crude oil for much of its plastic production needs. He said other researchers have already proven the ability to resell processed glycerol.

The team hopes to use research it has conducted based on information about the Purchase region to make it an easy and sustainable option for farmers.

Lone Oak senior Andrew



LANCE DENNEE | The Sun

Wes Whipple, University of Kentucky engineering student, describes the biodiesel manufacturing process while Lone Oak High School students Spenser Price and Sanjana Pampati listen as part of the Environmental Protection Agency's People, Prosperity and Planet competition at West Kentucky Community & Technical College in Paducah on Wednesday.

Stricklin said that if farmers used 4 to 6 percent of their soybean crop yield as oil for biodiesel, they would have fuel for their equipment for the planting and harvest seasons.

"From taking waste oil in soybeans you end up not only with fuel for equipment, but the glycerol would come out and be sold for profit," he said.

Stricklin said he and his high school peers spent one class block a week at the UK lab. They began assisting in September, he said.

"I feel like I just happened to be in a lucky group of people who have been allowed to come work on it," Stricklin said. "I'm really pleased and really grateful for it."

Two judges will review the more than 50 entrants from across the country. Seay said the judges will select eight to 10 groups to receive a \$75,000 grant, spread over two years, to continue the research. He estimated a glycerol processing facility for the Purchase area would require an initial investment of \$5 million.

He said biodiesel and other biomass energy options are not energy-dense, like coal and oil. Therefore, the project would stay on a regional level. Seay said residents of the Purchase area won't see anything like the traditional refinery plants. If the team receives the funding, Seay said, they'll be able to address more specific economic

impact questions.

Their idea is constructed to be adaptable, UK junior Wesley Whipple said.

"Eventually we'd like to see this get rolled out to the point where we could go to a different area where they have different resources and tailor-make our package," he said.

Whipple said the initial research and development planning is still in preliminary stages. Getting the phase two grant, Whipple said, would allow them to do more research and determine optimal placement for a future processing center.

Contact Rebecca Feldhaus, a Paducah Sun staff writer, at 270-575-8651.

SEPTEMBER 25, 2015 • VOLUME 2

PROGRESS

GROWTH AND CHANGE THROUGHOUT OUR REGION



A special publication of

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A *growing* ASSET

Paducah's UK College of Engineering benefits area

BY MALLORY PANUSKA

mpanuska@paducahsun.com

Each year, dozens of mechanical and chemical engineers hailing primarily from the western Kentucky region earn University of Kentucky-level degrees right in their backyards at Paducah's UK College of Engineering.

Nestled within the buildings that make up West Kentucky Community & Technical College's campus, the program was the first place in McCracken County to offer four-year degrees. Since the first students graced the hallways in 1997, the campus has grown and evolved, and today enrollment is at an all-time high with a 200 students on the fall 2015 roster.

David Silverstein, director of engineering extended campus programs, said the college experienced a 20 percent growth spurt in 2008 and kept climbing. And although the numbers are growing, the course sizes are still small enough for students to get plenty of personal attention, which officials say makes for the perfect situation because the degrees earned are still UK certified.

That level of recognition goes a long way for job placement, said



Jeffrey Seay, associate professor of chemical engineering at the UK College of Engineering in Paducah, shows the work of 12 students he took to India this summer to members of the press in India. The students carried out research on sustainable energy and agriculture to help better the lives of the people in the rural and under-developed region.

Contributed photo

Alex Sherwood, recruitment and career services director.

“I get calls every day from industries wanting our students,” she said. “There isn’t a day that goes by that I don’t get a phone call or an email looking for our UK alumni.”

Silverstein pointed out that while many of the companies are local, they are not just interested in local candidates.

“They are looking for the best people who they can hire and retain, and that’s generally a national search,” he said. “And the fact that they are choosing our students, I think, says a lot for the quality of people that we were missing previously before we had an engineering program here, as well as for the quality of individuals that are graduating.”

One of the reasons Silverstein said the students may be of particular interest to companies performing national searches is the college’s

global learning program.

Jeffrey Seay, associate professor of chemical engineering, has traveled across the globe with groups of students several times in the past several years performing hands-on engineering work, which he said adds significantly to the marketability of the students when they graduate.

“Our students participate in a career fair in Lexington and the international experience is certainly something that gets them noticed,” Seay said.

“It stands out on their resumes. All of the students who have been international and gone to the career fair have come back and reported that they have been noticed by hiring managers.”

Seay and 12 students recently returned from India and he has also taken two trips to Cameroon in 2012 and 2014, with plans to continue traveling to other underdeveloped



Contributed photo

University of Kentucky College of Engineering student Austin Warford (front) listens as David Silverstein, director of engineering extended campus programs, discusses some equipment inside a lab on campus. Located at West Kentucky Community & Technical College, the UK College of Engineering in Paducah offers four year degrees in mechanical and chemical engineering.

oped and rural regions for projects in the future.

Silverstein said that a little more than 70 percent of the Paducah engineering graduates go to top level jobs in McCracken County and across the region, while the remainder venture out to other places.

The existence of the college works in reverse as well. Silverstein said the fact that McCracken County has a top university-level educational facility turning out certified engineers is a driver for local industry recruitment.

“What caused this program to be developed was a desire of companies to have highly qualified engineers who would be more likely to

stay so they wouldn’t have constant turnover, plus professional development for their current employees,” he said.

When company officials interested in locating in Paducah with a need for certified engineers have visited the area, Silverstein said they have been surprised and pleased that the campus is right there producing that workforce. He added the benefit of having the certified faculty members on hand as well.

“We have people here who are internationally renowned experts in a lot of areas who are relevant to daily industrial practices,” Silverstein said.

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The Paducah Sun



RYAN HERMENS | The Sun

Block by block

Blocks are laid for a new staircase leading to the river at Schultz Park in Paducah as part of the ongoing riverfront redevelopment project. The \$8.1 million project was awarded last fall to MAC Construction & Excavating. Work began in December and is scheduled to be substantially complete this fall.

Kentucky Avenue intersections to get sensors installed this fall

BY GENEVIEVE POSTLETHWAIT

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For drivers traveling Kentucky Avenue in Paducah, the intersection at Old Mayfield Road/16th Street is often a point of daily frustration.

Cars can be stopped eight-deep in Kentucky's eastbound lanes while the westbound light goes green for no one. Only one direction of traffic is able to

move at a time — either northbound, south, east or west — and the signal has seemingly no connection to the actual traffic present.

But the light isn't broken, and it isn't just bad luck.

"The lights are not detecting the traffic there," explained Keith Todd, Kentucky Transportation Cabinet spokesman. "They're simply running on a timer. We commonly call that

a dumb signal. To make it a smart signal, we have to install the detectors, and those can't be installed until the rest of the work is done along the project."

The year-long, \$7.7 million reconstruction of Kentucky Avenue was completed in early March — for the most part. Two-way traffic resumed, but state crews still have minor

Please see **SENSORS** | 7A

Clinton knocks Trump's economic ideas

BY CATHERINE LUCEY AND LISA LERER

Associated Press

WARREN, Mich. — Her political fortunes flourishing, Hillary Clinton attempted to undercut Donald Trump's claim to working-class voters Thursday, portraying her Republican rival as untrustworthy on economic issues and pushing policies that would only benefit the super-wealthy

— himself included.

The Democratic presidential nominee sought to seize momentum as Republicans — including Trump — struck an almost defeatist note about their Election Day chances. As Republican leaders sounded alarms about Trump's unconventional approach, Clinton attacked what she dubbed "outlandish Trumpian ideas" that have been rejected by both

parties.

"Based on what we know from the Trump campaign, he wants America to work for him and his friends, at the expense of everyone else," she said after touring a Michigan manufacturing facility.

Appearing in a county known for so-called Reagan Democrats — working-class Demo-

Please see **POLICIES** | 7A

Grand jury won't indict local officers

BY JOSHUA ROBERTS

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A Graves County grand jury chose not to indict three Paducah Police officers Thursday, ending a potential criminal case against them stemming from bullets fired during target practice last January that struck a residence.

"Essentially, we're done with it," Graves Commonwealth Attorney David Hargrove said Thursday night.

"... (The grand jury's) decision was to take no action, that the conduct, while it may have been negligent, and they certainly believe it was, it did not rise to criminal conduct of wanton endangerment."

Graves County deputies said the officers — Capt. Joseph Hayes, Detective Brian Young, and Officer Jarrett Woodruff — fired department-issued .308-caliber bullets Jan. 27 that struck a Graves County home not far from the gravel pit where they were shooting. The homeowner reported a bullet narrowly missed a contractor who was there renovating a bathroom. Slugs were collected from the home, along with ammunition and three rifles.

An analysis later determined slugs that hit the home were fired from a Springfield M1A tactical rifle, a personal weapon of one of the officers.

The grand jury discussed the case in June. It did not indict but requested more information. Hargrove presented the additional information Thursday, and the panel declined to pursue charges.

He said he wasn't disappointed with the decision.

"No, not at all. Based on what they had, I think they

Please see **OFFICERS** | 7A

U.S. stock indexes close at record highs

BY ALEX VEIGA

Associated Press

Strong gains by energy companies and retailers helped nudge each of the major U.S. stocks indexes to a record high close Thursday, erasing mild losses from the day before.

The Standard & Poor's 500 index and Nasdaq composite had previously hit new highs last Friday. The Nasdaq also notched a record close on Tuesday.

Investors welcomed some better-than-expected quarterly results from Macy's and Kohl's, which spurred gains for several other big retail chains.

Energy stocks led the rally, getting a boost from a surge in oil prices. An industry report released Thursday projected a more even balance in the supply and demand for oil this year.

"It's been such an oversupplied market for a long period of time, to get that supply-demand closer to being in balance, or to be in balance, is a huge driver," said David Chalupnik, head of equities for Nuveen Asset Management.

Please see **GAINS** | 7A

UK students, Ugandans develop biodiesel project

BY KAYLAN THOMPSON

kthompson@paducahsun.com

Grocery bags, milk jugs, old lawn chairs, picnic cutlery.

Student and faculty researchers with the University of Kentucky College of Engineering in Paducah teamed up with their Ugandan counterparts this summer to convert that plastic trash into sustainable fuel.

Shelby Browning, a junior, and Sarah Willett, an

incoming freshman, are part of a research team called the UK Appropriate Technology and Sustainability research group, led by professor Dr. Jeffrey Seay.

The three returned from a 10-day trip to Uganda last week where they partnered with graduate students and professors from Makerere University in Kampala to

Please see **FUEL** | 7A



Chorus rehearsal

The Paducah Symphony Orchestra Children's Chorus

rehearses for the first time this season Thursday night at First Presbyterian Church in Paducah. The ensemble is made up of area youth in third through fifth grades, and the PSO Youth Chorus (not pictured) is composed of ninth through 12th graders.

RYAN HERMENS | The Sun

NATION

U.S. WON'T RECLASSIFY MARIJUANA

The Obama administration has decided marijuana will remain on the list of most dangerous drugs, rebuffing a push across the country for broad legalization.

3A



WORLD

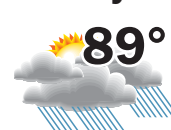
TERROR PLOT THWARTED IN CANADA

A tip from the FBI triggered what Canadian police on Thursday called a "race against time" as officers scrambled to identify and locate a would-be suicide bomber.

6A

Forecast

Today



Humid.

10A

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FUEL

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perfect a system that converts waste plastic to biodiesel.

"In the rural areas, and even in the cities, when someone has waste they just drop it on the ground because there's no incentive to doing anything with it. There's no organized trash collection," Seay said. "So the thing about this technology we've created is it gives someone incentive to hold on to that trash because now it has value."

Biodiesel is a fuel made from long-chain fatty acids, like vegetable oil, he explained. With limited access to used oils in Uganda, where palm oil is a valuable food staple, the team worked with what it did have, an overabundance of plastic trash cluttering the country.

The challenge was to create within a tight budget a process that works in a Third World country with limited electricity and low-tech equipment.

"So we took plastic, which is made from crude oil, and went the other way," Seay explained. "We can take it and, through a process called thermal decomposition, turn it into a fuel oil."

The plastic objects were run through a shredder before being poured into the thermal

processor. The processor melted down the fragments, breaking the polymers into smaller molecules that are recovered and put to use as fuel.

"We didn't invent this chemistry," Seay said. "We're not chemists, we're chemical engineers, so we're not in the business of developing new reactions. We're in the business of figuring out how to carry out chemistry in a challenging environment. In this developing-world setting, where we don't have access to the kinds of tools we have in the U.S., we figured out how to use it."

The collaboration began this spring when professors of Makerere University, having heard of the team's prior research on the subject, reached out about developing a partnership between the countries' students. In March, Seay led a team on an inaugural visit to establish the partnership and made a return visit last week with team members Willett and Browning. Other research team members who did not make the August trip include senior Chandi Joshi, junior John Higgins and Lexington campus junior Daniel DeNeve.

Browning has interned under Seay for three years, but this was her first research trip



Contributed photo

Dr. Jeffrey Seay (from left), Sarah Willett, Nicholas Munu, Dominic Aboagye, Shelby Browning and Ronald Kizza are part of a team of researchers from the United States and Uganda partnering to develop a processor that converts plastic to biodiesel fuel. Seay, Willett and Browning, of the University of Kentucky College of Engineering's Paducah campus, returned from a 10-day trip to Uganda last week. They worked with Munu, Aboagye and Kizza, of Makerere University in Uganda.

and her first ride in an airplane. Her job during the trip was to simply observe, absorb and learn. "The whole experience was wonderful," she said. "The students over there, they were all so excited to meet us, and you can tell that they loved what they were doing. I want to travel as much as I can, and I hope to eventually work in sustainability. I want to make sure that I do really well in my studies so I can keep going back and doing more things in the world."

Willett has traveled to

Cameroon, China, India and now Uganda under Seay's mentorship. She's working on two publications with the Makerere graduate students that will be peer reviewed.

"Working with students in other parts of the world, you can see what they had to do to get where they are," she said.

"The students in Uganda, they have a more open mind than we do because they've seen more poverty and things that we've never gone through. So it was cool to see their ideals

compared to what we would think. It's a different way of thinking."

Hands-on projects and global partnerships, she added, help bring her classroom studies to life and validate her hard work.

"Actually going to these places and seeing how your research affects the local community, how they're so willing to help and they want this, it's life-changing," Willett said. "It gives perspective to how we live here."

Seay said the most important product of the

research is his students' growth.

"It's rewarding to see them go through that process of where they start to get confidence in their abilities and see that they really can contribute something meaningful," he said.

"My favorite quote of all time is from the Lorax, 'Unless someone like you cares a whole awful lot, nothing is going to get better, it's not.' I'm not just their professor, I'm their cheerleader, and these kids are making things better than they found it."

SENSORS

CONTINUED FROM 1A

repairs and details to complete, including installing traffic sensors at Kentucky's intersections with 21st, 16th, 13th and Walter Jetton Boulevard.

"We're hoping to have it all done by Nov. 1," Todd said.

The sensors are last on the list, Todd said, because other work left on the "punch list" could inadvertently damage the sensors. Sensors are too expensive to risk the damage, so for now Kentucky Avenue drivers are stuck with timers.

As for the Kentucky-16th light allowing only one direction of traffic to flow at a time rather than alternating east/west and then north/south traffic flow, that's by design, Todd said, and won't change once the sensors are installed.

"It's been that way for years," he said. "They do that a lot on intersections where there are a lot of turns. Some of it's done based on crash history, traffic volumes and major traffic movements."

Any changes to the traffic lights along Kentucky Avenue would have to be addressed through the cabinet since it's a U.S. highway, Todd said. If the Paducah Police Department or Paducah City Commission were to request a change, the agency would conduct a traffic study and consider the options.

"There just are a lot of different factors that go into those decisions," Todd said. "There is some logic to it, believe it or not."

GAINS

CONTINUED FROM 1A

"That should at least support the commodity price."

The Dow Jones industrial average climbed 117.86 points, or 0.6 percent, to 18,613.52. The average is now up about 0.1 percent from its last record set July 20.

The S&P 500 index added 10.30 points, or 0.5 percent, to 2,185.79. That's a gain of 0.13 percent from its previous high last Friday. The Nasdaq composite index gained 23.81 points, or 0.5 percent, to 5,228.40. It edged up 0.1 percent from its previous high.

The latest market milestones reflect investors' improved confidence in the U.S. economy of late. Strong job growth, more stable oil prices and a crop of better-than-expected company earnings have helped lift stocks in recent weeks.

Still, overall earnings for companies in the S&P 500 are expected to be down 2.2 percent for the second quarter, according to S&P Global Market Intelligence. "We're still looking at negative earnings growth, albeit improved, and negative revenue growth," said Tim Dreiling, regional investment director for U.S. Bank's Private Client Reserve. "In order for stocks to continue to make new highs and continue to grind higher, we're going to need to see some improvement in revenues and see some improvement in earnings in the second half of 2016."

The major stock indexes got off to a strong start early Thursday, bouncing back from slight losses a day earlier.

POLICIES

CONTINUED FROM 1A

crats who voted Republican in the 1980s — Clinton tried to win back some of the blue-collar voters who have formed the base of her rival's support, making the case that she offers a steadier roadmap for economic growth and prosperity.

"I can provide serious, steady leadership that can find common ground and build on it based on hard but respectful bargaining," she said. "I just don't think insults and bullying is how we're going to get things done."

Clinton, who frequently boasts about her numerous policy plans, didn't offer any new, major ideas to improve the country's economy in her afternoon address. She reiterated her strong opposition to the Trans-Pacific Partnership trade deal, leaving herself little room for backtracking should she win the White House.

"I oppose it now, I'll oppose it after the election, and I'll oppose it as President," she said, while also noting that the U.S. should not cut itself off from the rest of the world.

Clinton once called the TPP the "gold standard" of trade

deals when she served as Obama's secretary of state, but she announced her opposition to the deal last year, saying it did not meet her standard for creating jobs, raising wages and protecting national security.

Hoping to keep the pressure on Trump, Clinton is also planning to release her 2015 tax returns in the coming days. Trump has said he won't release his until an IRS audit is complete, breaking tradition with every presidential candidate in recent history.

A source close to Clinton said she would soon release her return, supplementing the decades of filings she and her husband have already made public. Her running mate, Virginia Sen. Tim Kaine, and his wife will also release the last 10 years of their taxes. The source spoke on condition of anonymity to discuss the plans in advance.

Clinton's appearance followed Trump's own speech on the economy, which he delivered in Michigan on Monday. But his scripted remarks were quickly eclipsed by the latest in a series of blunders and controversial statements that appear to have handed Clinton's campaign a boost in the polls, particularly with Republican women and college-educated voters who make up a key piece of



Associated Press

Hillary Clinton gives a speech on the economy after touring Futuramic Tool & Engineering in Warren, Mich., Thursday.

the GOP base.

Just hours before her address, Trump unleashed another round of attacks on Democrats, calling Obama the "founder" of the Islamic State militant group — and Clinton its co-founder.

The Republican presidential nominee brushed off conservative radio commentator Hugh Hewitt's attempt to reframe Trump's observation as one that said Obama's foreign policy created the conditions in Iraq and Syria that allowed IS to thrive.

"No, I meant he's the founder of ISIS. I do," Trump said, using another acronym for the

extremist group that has wreaked havoc from the Middle East to European cities.

The latest bit of controversy shook Republicans, already rattled by polling showing Trump losing support among women and other segments of their party's base.

Dozens of frustrated Republicans gathered signatures Thursday for a letter to Republican National Committee Chairman Reince Priebus that urges the party chief to stop helping Trump and instead focus GOP resources on protecting vulnerable Senate and House candidates.

OFFICERS

CONTINUED FROM 1A

made the right call," he said. "There won't be anything else from us. If there is any civil action, that's a whole different matter with different people."

Hayes, Young and

Woodruff hired Paducah attorney Mark Bryant to represent them.

"I'm just really happy for my clients that the grand jury chose not to indict," Bryant said. "... What happened was terrible and they feel awful about it, but it was not a

crime. I'm glad nobody got hurt, my clients have been very apologetic for it, and it will never happen again."

Bryant said he doesn't anticipate a civil suit being filed against the officers.

"The only thing that

was damaged was a window and a ladder," he said.

"Nobody got hit. The whole issue is nobody got hurt. ... I've not heard about any kind of civil suit. That would be difficult because there's not any damage."

Paducah mayor's presence helps open doors in Gabon for university

BY CARRIE DILLARD

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Lambaréné, the capital of the Moyen-Ogooué district in Gabon, may just become Paducah's next "sister city."

Mayor Gayle Kaler, along with University of Kentucky-Paducah engineering professor Jeffrey Seay and chemical engineering undergraduate research student Chandni Joshi, visited Lambaréné in May.

The trip was intended to create continued opportunities for student research in the region, and Seay said the mayor's presence helped to make that happen.

"It's one thing for a professor and a student to show up," he said. "With Mayor Kaler, we got the attention of the head of state and high-ranking government officials. Her presence helped open doors."

UK has ongoing research in sustainable biofuels in nearby Cameroon, the country to the north of Gabon. Simultaneously with the trip to Gabon, a team of nine engineering students was flown to the village of Bangang, in rural Cameroon, to continue their research partnership with the African Centre for Renewable Energy & Sustainable Technology.

The university is looking to partner with the Gabonese government for the next phase in its research concerning bio-char, a charcoal by-product from the waste of that nation's bustling timber industry.

Because the soil in Gabon is clay-like and doesn't hold nu-



Submitted photo

The mayor of Lambaréné, Roger Valere Ayimambenwe (left), presents a key to the city to Paducah Mayor Gayle Kaler (center) during her trip to the African country of Gabon while University of Kentucky-Paducah engineering professor Jeffrey Seay looks on. Kaler, Seay and UK student Chandni Joshi visited Gabon in May to create opportunities for student research.

trients well, Seay explained, bio-char has the potential to be a soil additive for crops or used as a gas as a pesticide.

The university also hopes to foster a government-funded, study abroad project so students may return to Lambaréné each year to explore the possible uses of bio-char in the region.

Kaler brought legitimacy to their trip, Seay said.

"It was a benefit to us," he said. "We were told it was the first time a U.S. elected official had ever visited Lambaréné. It gave a high-profile nature to our visit."

UK extended the invitation to Kaler, and her travel arrange-

ments were made quickly, Seay said. The college had already secured funding for airfare for 10 students and Seay through an anonymous donor.

Seay said he went back to the donor for the extra airfare for Kaler.

Once the group reached Gabon, all expenses were paid by the government.

Kaler's visa was paid by the city of Paducah, at an estimated cost of \$142.

In many ways, Seay noted, the two cities are similar.

"Lamberene is about the same size (25,000 city population); it's in a lakes region; it has a timber industry and river industry," he said. "They have a

lot in common with Paducah."

Although many of its residents speak French, Gabon officials hope to make it a dual language country, he said. Because of this, the country may one day seek to hire retired teachers from Paducah and the surrounding areas to teach English overseas, he continued.

"This will be an opportunity for Paducah as well," Seay said. "They were impressed with Paducah's status as a UNESCO Creative City."

Paducah was invited into the Creative Cities Network last November, and lent its support for Suzhou, China, as it applied in the category of Crafts and Folk Art in April.

"Being a creative city has opened many avenues of connection with other countries," Kaler said. "They (Lambaréné) would like to be a sister city. They are very interested in our help for ideas about tourism and exchanges for education."

While she wouldn't speculate about the possible economic benefits that Paducah could see through the partnership, she does believe cultural exchange is important.

"Economic benefits are more than just getting a building or company that moves in," Kaler said. "Being connected to the world increases your visibility as a community. That's the key; that connection, because we are in a global market."

Contact Carrie Dillard, a Paducah Sun staff writer, at 270-575-8657.

The Paducah Sun

MONDAY, July 7, 2014 www.paducahsun.com Vol. 118 No. 188

Local vaccination rate high, but more resist

BY LEANNE FULLER

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A local pediatrician said he sees more Paducah-area parents who are choosing to delay or opt out of vaccinating their children today than in years past, a choice he does not agree with.

"I've been doing this 31 years now, and basically we almost never used to have any parent opt out of vaccines," said Dr. David Schell of Pediatric Group of Paducah. "But we're having more and more people opt out. Not a huge number, but more than we ever used to have."

Vaccines — dead or weakened infectious organisms which are administered to produce immunity in people without contracting the diseases the living organisms cause — have become a bigger issue in the United States as more people are contracting vaccine-preventable illnesses in various parts of the country.

Measles is one such illness. According to the Centers for Disease Control and Prevention, between Jan. 1 and June 27 of this year, 539 cases of measles were reported in 20 states. Those states include Illinois, Missouri

and Tennessee but not Kentucky.

The CDC's running tally of reported measles cases and outbreaks — the latter accounting for 88 percent of reported cases so far this year — is available on its website. The government health organization notes "this is the highest number of cases since measles elimination was documented in the U.S. in 2000" and "the majority of the people who got measles are unvaccinated."

Pertussis, also known as whooping cough, has reached epidemic levels in California, where the California Department of

Public Health reported the total number of cases reached 4,558 as of June 24. Three infants have died in the epidemic so far.

Brandi Day, regional epidemiologist for the Purchase District Health Department, said Region One — made up of Ballard, Calloway, Carlisle, Fulton, Graves, Hickman, Marshall and McCracken counties — has had no confirmed cases of measles this year and none in 2013 or 2012.

"But of course, we're not saying we don't think it's going to happen," Day added. "We have to be alert because of outbreaks in

Ohio."

According to the Ohio Department of Health, that state's measles outbreak began when unvaccinated travelers were exposed to the disease abroad. The state has recorded 368 cases and 10 hospitalizations so far this year.

Looking at pertussis, Day said no cases have been confirmed in Region One so far this year, but there were a few — less than five, she said — confirmed in the past two years.

Schell said although more lo-

Please see **VACCINATIONS** | 9A

Studying abroad can improve resumes

BY CARRIE DILLARD

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Study abroad opportunities offer college students a chance to build their resume before they enter the workforce.

No one knows this better than Mitchell Peeler, an undergraduate at the University of Kentucky College of Engineering-Paducah extended campus. He traveled with nine other students and engineering professor Jeffrey Seay in May to Cameroon, Africa, as a part of a Global Service Learning in Engineering class.

For Peeler, who will be a senior this fall, this was his second trip to the sub-Saharan country.

"I've been to several job fairs. When they see (Cameroon) on my resume, it sets you apart from others in the room," he said.

Seay's students are involved in ongoing research in sustainable biofuels in partnership with the African Centre for Renewable Energy & Sustainable Technology (ACREST), a non-governmental organization that maintains a technology center and workshop

Please see **ABROAD** | 10A



JOHN PAUL HENRY | The Sun

Strength against strength

Dan Mosier of Louisiana (left), originally from Eddyville, competes against **Cody Hadley** of St. Louis on Sunday in the Second Annual Arm Wrestling Championship at Four Rivers Harley Davidson in Paducah. Mosier caught Hadley's jump and fought back to win the left-handed match. There were close to 80 competitors at the Tennessee Arm Wrestling Association event, including the 14th and 18th ranked wrestlers in the world and a U.S. champion. Each wrestling class winner won a chance at a free Harley-Davidson Motorcycle. Mosier ultimately took home the prize.

New lottery game sales higher than expected

BY KEVIN WHEATLEY

The State Journal

A new lottery game in Kentucky has exceeded sales expectations since its launch in November despite attracting fewer retailers than anticipated.

Keno, a bingo-style game with draws every five minutes, sold \$28.5 million in wagers as of June 21, half a million more than projected for the 2014 fiscal year, said Kentucky Lottery Chief Financial Officer Howard Kline. With sales averaging \$864,000 per week, the lottery expects fiscal year totals of about \$29.4 million, he said.

Some lawmakers feared that Keno would create more gambling addicts. Sen. Bob Leeper, I-Paducah, said during an interim appropriations and revenue committee last year that the five-minute drawing interval at locations with a mix of gambling and booze would "dramatically" increase the number of addicts.

Mike Stone, executive director of the Kentucky Council on Problem Gambling, said it's too

Please see **LOTTERY** | 10A

At 50, theater is 'a jewel in Paducah'

BY LAUREL BLACK

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When local actors talk about their involvement in the Market House Theatre, the conversation always comes back to one theme: family.

Over the last half-century, multiple generations of real-life families have found their second home at the Market House, while its more than 540 productions have made "stage families" out of perfect strangers.

"It's like a brotherhood,"

said Roy Hensel, a Lone Oak Intermediate School teacher who's been involved in the theater for more than 30 consecutive years.

The amateur actor has watched his two children, Travis and Emily, grow up on the Market House stage, and recently saw his 4-year-old grandson, Jack, make his debut in a children's production. He's seen his students flourish, too, both in productions and the theater's youth program, Footlights.

"There's so many talented children, and sometimes acting is an option they never thought of before," he said. "It gives them confidence."

Many Market House veterans have similar stories.

Janey Collins, clinical director at Childwatch, is a Footlights alumna who says her daughters Lily, 13, and Laurel, 10, have learned about commitment and kindness

Please see **THEATER** | 9A



Photo contributed

Eight people founded the Market House Theatre in downtown Paducah in 1963 and held their first production in a temporary space in April 1964. Fifty years later, the theater has expanded to include three historic buildings on the square, and now serves around 40,000 adults and children each year.

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Forecast

Today

93°

Partly sunny

10A



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ADVICE

From our Local Professionals

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Steve Warren

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Trish Edwards

ABROAD

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in the village of Bangang in rural Cameroon.

ACREST has worked with various U.S. universities, including UK and Purdue, to develop low-cost, sustainable solutions to improve the standard of living in underdeveloped regions of Africa.

"For the most part, as a college student, your goal is to impress a professor for a grade," Seay said. Having these experiences abroad, he said, makes students more attractive to a prospective employer.

"All companies these days are globally active. Having this on their (student's) resume says 'I have a passport. I'm not afraid to navigate in an unfamiliar environment.' These are real, tangible benefits to an employer," Seay said.

The UK College of Engineering has been a partner with ACREST since 2011. The first student trip to Bangang was in May 2012, focused on exploration of the area and its resources. The trip was funded through private donations.

UK research students weren't able to travel to Africa in 2013 because the program did not have the necessary funds, Seay said,

but in 2014, an anonymous donor helped them pay airfare for a second trip. The program currently has enough money left from the anonymous donation to send a small group back to Cameroon in 2015, he noted.

In May, the team was successful in producing biodiesel for a basic utility vehicle (BUV), which is essentially a three-wheeled farm cart built from junkyard car parts and powered by a diesel motor.

Because it is too costly for anyone who lives in the village to own a vehicle, ACREST rents the vehicle to villagers at a low cost. This is especially important during harvest time, Seay said, as villagers can get their crops to market faster.

"To bring their crops to Chong, the nearest big city, it'd take all day to carry or pull in a cart," Seay explained.

Unlike making biodiesel in the U.S., the process in Cameroon is powered by a wood fire, has no electronic controls and is built from used oil drums and sheet metal.

"We want to make this as sustainable as possible," said Bradley Butler, a mechanical engineering grad-

uate student who helped build biodiesel reactors in Cameroon.

It took the students three days to build two reactors in Cameroon. With only one welding machine available and the nearest store a half day's ride away, it was a slow pace.

"The pace of life is very different," Seay said. "As Americans, we're used to getting things right away. If we want to know something, we look it up on the Internet. If we want to buy something, we get it in town or order it on Amazon and overnight it."

Instead, if you need a part or to buy a product, he said, "it's going to take all day or maybe two. We're used to getting in the car to go to the store to buy one item. You can't do that in Africa. That's why the students have to go there," Seay said. "Whatever misconceptions they might have had about Africa go out the window."

Biodiesel is made from castor oil, methanol and lye. Each reactor can make five gallons of fuel per batch. Because there is no gas station in the village, having a local source of fuel is important, Seay said.

Having built a reactor prototype and conducted

experiments in the lab at UK-Paducah, the students knew the end product would work as a fuel, but seeing the BUV running on their biodiesel for the first time was something Peeler won't ever forget.

"It was awesome," he said. "We gave them something that was completely unthought of before we got there."

Other students who participated in the study abroad trip were Max Croft, chemical engineering; William Croft, chemical engineering; Keaton Johnson, chemical engineering; Chandni Joshi, chemical engineering; Kyle Lewis, mechanical engineering; Christina Willett Trammell, chemical engineering; Sarah Willett, a Marshall County graduate and incoming chemical engineering freshman; and Zac Watson, mechanical engineering.

Seay said the college will continue its partnership in Cameroon, helping maintain the reactors and collecting data on the amount of biofuel ACREST is making and its impact on the local community.

Contact Carrie Dillard, a Paducah Sun staff writer, at 270-575-8657.



Contributed

Students from the University of Kentucky College of Engineering-Paducah extended campus traveled to Cameroon, Africa, in May as a part of a Global Service Learning in Engineering class.



Contributed

These biodiesel reactors were built by students from the University of Kentucky College of Engineering-Paducah in a rural village of Cameroon, Africa, to help provide a low-cost fuel option for villagers there.

LOTTERY

CONTINUED FROM 1A

early to tell whether Keno has created new gambling addicts.

"But we can say from a big, general picture that any time gambling expands, one of the key risks of gambling addiction is the opportunity to gamble, and so obviously then if gambling expands, there's more opportunity for the potential

for gambling problems to develop," he said.

"But we have no data right now that Keno has had any significant impact."

Even though the lottery has topped sales projections since Keno's introduction, retailers have been difficult to attract in the game's brief existence. Kentucky Lottery expected to have 400 Keno-only re-

tailors by the end of June, but as of May 31, only 272 such locations offer the game, Kline said, noting the next fiscal year, which began Tuesday, has a 450-location target.

Keno has been marketed as a more social game, so the Kentucky Lottery has reached out to businesses that traditionally don't offer lottery games, such as bars and restaurants.

"Recruiting new retailers, especially Keno-only retailers, is one of our major tasks going forward," Kline said. "We're hoping to have 400 retailers by the end of the fiscal year. Obviously we're short of that. We need to continue to grow our base."

The council stays neutral on gambling, Stone said, calling it a personal choice. His only concern with im-

plementing Keno in social settings is that establishments properly advertise that gambling can be addictive.

The Kentucky Lottery has been "very diligent" in that regard with its "Play Responsibly" campaign, he said. The Kentucky Council on Problem Gambling also markets the addictive nature of gambling and resources available should is-

sues develop, he added.

"They (Kentucky Lottery) have no mandate to do that," Stone said of advertising resources for problem gambling. "They did that out of social responsibility."

Chip Polston, spokesman for Kentucky Lottery, said \$18.5 million, or about 65 percent of sales, had been paid in winnings as of June 21.

Paducah 5-Day Forecast

Today	Tonight	Tuesday	Wednesday	Thursday	Friday
93°	76°	92° / 70°	87° / 66°	88° / 67°	90° / 71°
Partly sunny and humid	Mostly cloudy, a t-storm; warm	T-storms, some severe in the p.m.	Partly sunny with a thunderstorm	Partly sunny with a thunderstorm	Partly sunny

Almanac
Paducah through 2 p.m. yesterday
Temperature
High 85°
Low 62°
Normal high 89°
Normal low 69°
Record high 107° in 2012
Record low 53° in 1968
Precipitation
24 hrs ending 2 p.m. yest. ... 0.00"
Month to date 0.93"
Normal month to date 0.87"
Year to date 27.81"
Last year to date 35.09"
Normal year to date 26.15"

Sun and Moon
Full July 12
Last July 18
New July 26
First Aug 3
Sunrise today 5:42 a.m.
Sunset tonight 8:18 p.m.
Moonrise today 3:23 p.m.
Moonset today 1:30 a.m.

UV Index Today
The higher the AccuWeather.com UV Index™ number, the greater the need for eye and skin protection.
2 5 8 8 5
8 a.m. 10 a.m. Noon 2 p.m. 4 p.m.
0-2 Low; 3-5 Moderate; 6-7 High; 8-10 Very High; 11+ Extreme

Around the Region

City	Today	Tue.	City	Today	Tue.
St. Louis	96/76		Evansville	92/75	
Carbondale	93/74		Owensboro	92/74	
Cape Girardeau	92/75		Paducah	93/76	
Cadiz	92/72		Clarksville	91/73	
Blytheville	93/75		Union City	93/73	
Nashville	92/73		Jackson	91/72	
Memphis	93/75		Pulaski	92/68	

Lakes and Rivers
Through 7 a.m. yesterday (in feet)

River	Flood stage	Stage	24 hr Change
Paducah	39	16.80	-0.60
Owensboro	38	10.70	+0.20

Mississippi River

City	Flood stage	Stage	24 hr Change
Cairo	40	30.05	-0.71

Weather (W): s-sunny, pc-partly cloudy, c-cloudy, sh-showers, t-thunderstorms, r-rain, sf-snow flurries, sn-snow, i-ice.
Forecasts and graphics provided by AccuWeather, Inc. ©2014

Around the Nation
Shown are today's noon positions of weather systems and precipitation. Temperature bands are highs for the day.

National Summary: Heat and humidity will surge back across the East Coast today, setting the stage for thunderstorms, some damaging, to rumble from northern New England to the Ohio Valley. Violent thunderstorms will also target the central Plains in the afternoon. Thunderstorms will return to the Southwest as heat bakes the rest of the West, away from the coast.

City	Today	Tue.	City	Today	Tue.
Albuquerque	92 68 s	89 69 pc	Little Rock	94 74 s	93 74 pc
Atlanta	88 71 s	90 72 pc	Los Angeles	81 66 pc	79 64 pc
Baltimore	94 73 pc	93 74 pc	Miami	89 77 t	89 76 t
Billings	81 58 s	84 62 s	Milwaukee	84 66 pc	76 59 t
Boise	98 66 s	99 70 s	Minneapolis	82 62 pc	76 59 t
Boston	86 72 pc	90 72 pc	New Orleans	91 74 pc	88 75 t
Charleston, SC	92 77 pc	95 79 pc	New York City	91 75 pc	90 77 pc
Charleston, WV	91 68 pc	86 67 t	Oklahoma City	99 74 s	97 72 s
Chicago	88 68 pc	82 63 t	Omaha	89 66 t	82 59 pc
Cincinnati	85 70 t	85 66 t	Orlando	90 73 t	90 74 t
Cleveland	82 68 t	80 65 t	Philadelphia	93 76 pc	94 76 pc
Dallas	96 76 s	97 78 s	Phoenix	104 87 t	101 78 t
Denver	95 59 t	82 59 t	Pittsburgh	82 68 t	83 66 t
Des Moines	89 66 t	81 61 t	Portland, OR	88 63 s	87 61 s
Detroit	85 66 pc	80 62 t	Salt Lake City	97 66 s	97 70 s
El Paso	94 71 pc	95 76 pc	San Antonio	93 74 s	93 74 s
Fairbanks	69 58 sh	69 57 t	San Jose	83 59 s	79 58 s
Honolulu	88 74 s	88 75 s	San Diego	77 68 pc	74 68 pc
Houston	92 74 t	90 74 t	San Francisco	73 58 s	71 59 s
Indianapolis	87 70 t	81 63 t	Seattle	81 60 s	82 60 s
Jacksonville	90 71 t	92 72 t	Tucson	96 78 t	89 78 t
Las Vegas	103 86 t	105 87 pc	Washington, DC	95 77 pc	95 76 pc

Around the World

City	Today	City	Today
Athens	93 74 s	Moscow	76 56 pc
Beijing	87 74 c	Paris	70 55 pc
Berlin	85 64 t	Rome	85 68 pc
Buenos Aires	60 46 s	Seoul	90 75 s
Cairo	96 71 s	Sydney	64 42 s
Hong Kong	94 83 t	Tokyo	80 74 t
Jerusalem	82 64 s	Warsaw	85 66 t
London	71 55 sh	Zurich	73 57 t
Manila	85 78 r		
Mexico City	69 56 t		

AccuWeather.com

பிளாஸ்டிக் கழிவுகளிலிருந்து மாற்று எரிபொருள், கரிமூட்டம் மூலம் இயற்கை பூச்சிவிரட்டி

அமெரிக்க பொறியியல் கல்லூரி மாணவர்கள் கண்டுபிடிப்பு



பிளாஸ்டிக் கழிவுகளில் இருந்து மாற்று எரிபொருள் தயார் செய்வது தொடர்பாக விளக்கமளிக்கிறார் அமெரிக்காவின் கென்டகி பல்கலைக்கழகத்தின் பொறியியல் வேதியியல் துறை பேராசிரியர் ஜெப்ரிஜி, உடன், மாணவ, மாணவியர்.

தொடர்ந்து 40 நாட்கள் தங்கியிருந்து, இங்கு கிடைக்கும்பொருள்கள் மூலமாக புதிய கண்டுபிடிப்புகளை உருவாக்கியுள்ளனர்.

இது தொடர்பாக கென்டகி பல்கலைக்கழக பொறியியல் வேதியியல் துறையின் பேராசிரியர் ஜெப்ரிஜி செவ்வாய்க்கிழமை கூறியது.

இப்பகுதியில் விவசாயிகள் பயன்படும் வகையில் சைமென்ட் மரங்கள் மற்றும் பிளாஸ்டிக் கழிவுகளை கொண்டு மரவீனிகள், மாற்று எரிபொருள் கண்டறிந்தனர் எனும், இதில், 1 கிலோ பிளாஸ்டிக் கழிவுகளில் இருந்து 1 லிட்டர் மாற்று எரிபொருள் உற்பத்தி செய்ய முடியும். அதை ஆயில் மொட்டாரில் ஊற்றி இயக்கியதில் ஏற்கனவே உசலில் இயங்கும் தோத்தை விட 75 சதவீதம் சுடுதலாக ஓடியது.

அதேபோல், 4 கிலோ சைமென்ட்மூலம் விறகிலிருந்து 3 லிட்டர் மரவீனிகள் தயாரிக்க முடியும். இதை பயிர்களில் இயற்கை பூச்சி விரட்டியாகவும் பயன்படுத்தலாம். இதை விவசாயிகள் சாதாரண முறையில் உற்பத்தி செய்து பயன்படுத்தவதன் மூலம் எரிபொருள் மற்றும் பூச்சிக் கொல்லம் மருந்து செலவை குறைக்க முடியும்.

தற்போது, இதற்கான சாதலங்கள் தயாரிக்க நூர் ஆயிரம் வரை செலவாகிறது. இத்தொழில் வளர்ச்சி அடைதல் போது, சாதலங்களில் விளைவு துறையும்.

எனவே, விவசாயிகள் இது தொடர்பாக ஓட்டி கொண்டு திறமையான மூலம் பொதுவானவர்களுக்கு செயல்முறை அறிக்கவும் உணர்வுகளை அவர் தெரிவித்தார்.

விருதுநகர், ஜூலை 21: விருதுநகர் மாவட்டம், திருச்சுழி அருகே சுற்றுச்சூழலுக்கு பாதிப்பு ஏற்படாத வகையிலும் பிளாஸ்டிக் கழிவுகளில் இருந்து மாற்று எரிபொருள் மற்றும் சைமென்ட்மூலம் மர கரிமூட்டத்தின் மூலம் இயற்கை பூச்சி விரட்டியும் அமெரிக்க பொறியியல் கல்லூரி மாணவ, மாணவிகள் கண்டுபிடித்துள்ளனர்.

திருச்சுழி அருகே ஓட்டம் தொண்டு நிறுவனம் மகளிர் மற்றும் குழந்தைகளுக்கான சுகாதார மேம்பாட்டு திட்டங்களை செயல்படுத்தி வருகிறது. இவர்கள், காட்டமணக்கு விதைகளில் இருந்து எண்ணெய் தயாரித்து, மாற்று எரிபொருளாகவும் பயன்படுத்தி வருகின்றனர்.

இது தொடர்பான தகவல்களை இணைய தளத்தில் கண்ட அமெரிக்க கென்டகி பல்கலைக்கழக பொறியியல் வேதியியல் துறை பேராசிரியர் ஜெப்ரிஜி தொண்டு நிறுவன நிர்வாகிகளை தொடர்பு கொண்டுள்ளனர்.

இதையடுத்து, ஆய்வு மேற்கொள்வதற்காக கடந்த ஜூன் மாதம் ஓட்டம் தொண்டு நிறுவன ஆராய்ச்சி மையத்திற்கு கென்டகி பல்கலைக்கழக பொறியியல் வேதியியல் துறை பேராசிரியர், 13 மாணவ, மாணவிகள் குழுவின் திருச்சுழி வந்தனர். இப்பகுதியில்

மாணவர்களிடையே வாசிக்கும் பழக்கம் குறைந்து வருகிறது பள்ளி தலைமையாசிரியர்களுக்கான

TEAM MEMBERS WORK ON PRODUCTION OF FUEL OIL FROM PLASTIC WASTE

RESEARCHERS PRODUCE NON-TOXIC PESTICIDE FROM 'SEEMAI KARUVELAM'

PROJECT VIEW

There has been struggle to make water tanks, irrigation channels and abandoned lands in southern districts free of seemai karuvelam trees which severely deplete groundwater table

The prototype processor built by UKATS research team can be made using simple materials and run without electricity; it needs very less technical expertise to operate



Wood vinegar that is extracted can be used as a non-toxic pesticide for crops

In Madurai City alone, over 200 tonnes of plastic is collected every day by the corporation. Also, a large amount of plastic items are dumped in rural landfills

Fuel oil produced from plastic, as conceived in the processor, is an environment-friendly and emission-free substitute to kerosene and diesel

It is more economically viable than other fuels

S. Poorvaja

TIRUCHULI (VIRUDHUNAGAR DISTRICT):

While environmentalists, people of southern districts, district administrations and municipal corporations continue to battle against 'seemai karuvelam' or *Prosopis juliflora* trees, a team of researchers from the University of Kentucky, United States of America, have devised a sustainable solution to make use of the wood from the tree, which depletes groundwater level.

The University of Kentucky Appropriate Technology and Sustainability

(UKATS) research team, which has been working with the Organisation of Development Action and Maintenance (ODAM), an NGO in Tiruchuli, has focused on extraction of 'wood vinegar' from seemai karuvelam trees which can be used as pesticide.

"The wood is processed into bio-char, which is non-poisonous and the wood vinegar extracted can be used locally by farmers on their crops. The pesticide is completely organic and encouraging its production could help present a long-term solution to the problem of eradicating *Prosopis juliflora* trees,"

said Jeffrey Seay, Associate Professor of Chemical Engineering.

Fuel oil

In addition to this, the UKATS team also worked on a low-cost processor which could convert waste plastic, polythene bags and plastic bottle caps into fuel oil which can be used to run irrigation pumps and cooking stoves.

"While its uses are similar to kerosene and diesel oil, it is much cheaper to produce and as effective while being sustainable," said Chandni Joshi, a member of the team. The team undertook a visit to a landfill in a village to get an idea

of the amount of plastic waste generated.

Having carried out a sustainability study, William Croft of the UKATS research team said that implementation of this technology could be transformative for the community.

"Many communities are sitting on so much of plastic waste and are unaware that it can be effectively used. With the low-cost processor we have devised, we are able to extract at least one litre of fuel oil from every kg of plastic waste which makes it economically viable," he added. O DAM to help implement technology locally.

TO BENEFIT LOCAL COMMUNITIES

With sustainable projects developed by the UKATS research team, the Organisation for Development Action and Maintenance (ODAM), Tiruchuli, is hoping to implement them for the benefit of the local communities.

"We have been working on projects based on how best we can utilise the local resources available and the effective utilisation of seemai karuvelam trees, which are invasive and rampantly found in the area will be very beneficial," said A.P. Mayandi, Director of O DAM.

The research team also worked with the repair and upgradation of the existing bio-diesel processor and seed press on the O DAM premises. "We spent the last few weeks, studying the processor, carrying out repairs and upgrading safety parameters involved in its operation. While bio-diesel can be produced, there is also a facility to make soap using the extracts and the women from the local community can be roped in for its manufacturing," said Maxwell Croft, a member of the UKATS research team.



Members of the University of Kentucky Appropriate Technology and Sustainability research team demonstrate functioning of a bio-diesel processor and extract wood vinegar from 'seemai karuvelam' trees. -PHOTOS: G. MOORTHY

10 fishermen country boat

Staff Reporter

TUTICORIN: Ten fishermen of Thressuram stranded at mid sea were rescued by Coastal Security Group on Tuesday.

They were in distress after the engines of two country boats, in which they sailed, suffered failure. Swiftly responding to rescue calls received through CSG helpline -1093 at 8.30 a.m. and 1.30 p.m., the CSG personnel located the

Veteran jour

Special Correspondent

RAMANATHAPURAM: Veteran journalist Allah Bux died on Tuesday after brief illness.

Mr. Bux who had been in the field of journalism for more than 50 years, serving for *Daily Thanthi* suffered breathlessness and died here around 2.30 p.m.

He was 78 years old and he is survived by his wife Mumtaj and son Abul Kalam Azad. *Daily Thanthi* reporter. Bux entered the field of journalism at a very young age soon after completing the Pre University Course (PUC).

He was introduced to journalism by his father, Seeny 17, who had served as agent

PF grievan

Special Correspondent

TIRUNELVELI: The Employee Provident Fund Organisation's monthly grievance meeting will be held on EP Sub-Regional Office premises at N.G.O. 'F' Colony. Pe