

# ACTION IN AGROFORESTRY

monthly newsletter of The Center for Agroforestry at the University of Missouri

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Michael Gold and Michelle Hall, editors

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## In the News: Plant Buffers Slow Antibiotic Runoff

Field tests by University of Missouri scientists have backed up laboratory research showing buffer strips of grass and other plants can reduce the amount of herbicide and veterinary antibiotics in surface runoff from farm plots.

Vegetative buffer strips have already proven effective in limiting erosion and reducing sediment and nutrients in runoff.

The findings come amid concerns about the potential of veterinary antibiotics in surface water leading to the emergence of antibiotic-resistant bacteria. The antibiotics can enter the environment through manure from confined animal feeding operations and from crop fields fertilized with manure.

“Vegetative buffer systems are recognized as one of the most effective approaches to mitigate surface water runoff from agroecosystems, and we think that such systems also have the utility for reducing veterinary antibiotic loss,” said Bob Lerch, USDA soil scientist and MU adjunct professor.

Researchers compared the effectiveness of three grass buffer treatments in reducing the transport of herbicides and veterinary antibiotics in surface runoff. Plant species used in the three treatments included tall fescue, switchgrass and native warm-season grasses—mainly eastern gamagrass. The control treatment was cultivated fallow.

The researchers applied three herbicides and three antibiotics, then generated surface water runoff using a rotating-boom rainfall simulator. Water and suspended sediment samples were collected and measured.

All vegetative buffer systems significantly reduced the transport of both dissolved and sediment-bound herbicides atrazine, metolachlor and glyphosate in surface runoff by 58 to 72 percent, said Chung-Ho Lin, research assistant professor with The Center for Agroforestry and department of forestry at MU.

In addition, the processes governing herbicide fate also applied to veterinary antibiotics. Four to eight meters of grass buffers reduced more than 70 percent of veterinary antibiotics in runoff surface water, Lin said.

Antibiotics included Tylan, used in swine feed to promote growth and as a disease preventative; sulfamethazine, also used in swine feed with other antibiotics, and Baytril 100, used for swine and cattle for respiratory illnesses.

Filter strips provide an opportunity to use an accepted practice in a manner people had not yet explored, said Keith Goyne, MU assistant professor of environmental soil chemistry.

One goal of the research is to provide simple, practical guidelines that agencies, land managers and agroforestry practitioners can use in designing effective buffer strips, Lerch said.

Science Daily has included an article about this research; see it at <http://www.sciencedaily.com/releases/2011/03/110322161535.htm>

— MU Cooperative Media Group

### ELDERBERRY DECISION MODEL NOW AVAILABLE ONLINE

The Center for Agroforestry at the University of Missouri offers various support tools to help prospective producers make decisions about establishment and management techniques for different alternative crops.

The newest tool, available online at <http://www.center-foragroforestry.org/profit/elderberryfinance.php>, is the Elderberry Financial Decision Support Tool. Elderberry (*Sambucus canadensis*) is a versatile, easily-grown native shrub for the Midwest and is well-suited to riparian



forest buffers and alley cropping.

The Elderberry Financial Decision Support Tool is an Excel (©Microsoft Corporation)-based model

that allows the user to select multiple options from a list of the most common establishment, management, harvesting and marketing techniques to determine the methods that will generate the best economic returns.

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## KUDOS

**Cammy Willett** will present at the MU Graduate Professional Council's annual state legislative event April 21. Willett was the only graduate student selected to make a presentation to the legislators as a result of her winning presentation at the Research and Creative Activities Forum (RCAF) in early March:

***Streambank Erosion Rates in Two Watersheds of the Central Claypan Region.*** Streambank erosion rates were monitored in two agricultural claypan watersheds located in northeastern Missouri during 2008 and 2009. Results of the study indicated streambanks contributed 69,000 tons of sediment annually, which accounted for 57-88 percent of the total in-stream sediment for Crooked and Otter Creek watersheds. Streambanks contributed 66 tons of nitrogen (N) annually, which represented 7.5 percent of the total N transported out of the study area, and also 805 tons of carbon. Improved management of riparian areas to decrease streambank erosion would result in significant water quality improvement in streams of the Central Claypan region.

## OUTREACH

**Ken Hunt** gave the following recent presentations:

He spoke on nut trees Feb. 12 at the "Putting Small Acres to Work" workshop, Quincy, Ill. The event was presented by the University of Illinois Extension.

## COMING SOON...

**June 4-9** 12th North American Agroforestry Conference  
University of Georgia, Athens, Ga.  
<http://hosting.caes.uga.edu/2011NAAC/>

**June 8-9** Comprehensive Elderberry Workshop  
**June 10-11** Elderberry Festival  
Eridu Farm, Hartsburg  
<http://elderberrylife.com/index.html>

**June 24-26** Chestnut Growers of America annual meeting  
Louisiana, Mo.  
<http://www.wcga.net/>

**Aug. 16, Sept. 13** Chestnut Workshops  
Contact [rhoadsj@missouri.edu](mailto:rhoadsj@missouri.edu) for info.

He presented on pecan cultivar nut yields at HARC at the Kansas Nut Growers Annual Meeting March 12, Parsons, Kan.

He performed a demonstration on grafting pawpaws at the Hands On Fruit Care Workshop Series, University of Missouri Extension, March 18, Columbia, Mo.

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**Larry Godsey** presented on "Forest Tax and Estate Planning" at the Tri-State Forestry on the Grow Conference, March 11, Idabel, Okla. Sponsored by the Ouachita Mountains Resource Conservation and Development (RC&D) Council.

## RESEARCH

**Chung-Ho Lin** has initiated the following collaborations:

NSF EAGER Plant VOCs project, with Drs. Jack Schultz and Heidi Appel, MU Life Science Center.

NSF UMEB Fellowship (Undergraduate Mentoring in Environmental Biology), with Drs. Jack Schultz, Heidi Appel and Caitlin Vore, MU Life Science.

## IMPACT

**Feng 'Ken' Ye** joined UMCA as a new graduate research assistant under Francisco Aguilar in January 2011. Ye will work with other UMCA scientists to evaluate the socio-economic benefits of vegetative buffers in whole farm systems; in particular, to their capacity to ameliorate odors. He is a Ph.D. student in the department of forestry.



**T**he Allen Research and Education Project (AREP), located just outside of Laurie, Mo., is a busy place. This spring was no exception. With assistance from the local Master Naturalists Chapter, controlled burning



took place the first week of April. Fields of native warm-season grasses and forbs must continually be managed to control tall fescue and other undesirable cool season grasses. These native grasses and forbs provide excellent habitat for

habitat-sensitive wildlife, such as bobwhite quail. Approximately a quarter of the open field areas were burned this year. An additional bonus to work on AREP is being watched over by eagles. A nesting pair is ever vigilant this time of year.



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