



## GOALS OF ARRI

- Plant more high-value hardwood trees on reclaimed coal mined lands in Appalachia.
- Increase the survival rates and growth rates of planted trees.
- Expedite the establishment of forest habitat through natural succession

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## Governor Fletcher, UK President Todd Sign SMI

The reforestation of coal-mined lands using high-value hardwood trees will be promoted under an initiative signed on August 17, 2005 by Governor Ernie Fletcher, University of Kentucky President Lee Todd and representatives of the Kentucky coal industry.

In a ceremony at The University of Kentucky/Lexington-Fayette Urban County Government (LFUCG) Arboretum, Governor Fletcher and Dr. Todd became partners with six other states and their universities in ARRI

Governor Fletcher said the partnership fits with the goals of the state's new, comprehensive energy strategy.

"We want to grow our economy, utilize our resources in a sustainable manner and at the same time, protect and maintain our commitment to



**AR Regional Director Brent Wahlquist observes Gov. Fletcher and Dr. Todd signing SMI**

environmental quality," said Governor Fletcher. "The ARRI initiative compliments our state's energy strategy to promote progressive reclamation practices through reforestation."

Governor Fletcher also said that more than 1 million native hardwood trees have already been planted throughout the Kentucky coalfields in an existing partnership with UK and others.

Dr. Todd said the program is an

extension of UK's statewide mission to improve conditions throughout the Commonwealth.

"One of the primary tenets of our land-grant mission is to conduct research that will promote positive change throughout Kentucky," said Todd. "Today we are seeing some of that research in action with the ARRI. UK researchers have invested countless hours studying best practices for planting trees on abandoned coal mines. We are excited to partner with the state, the Office of Surface Mining and other organizations as we work to make Kentucky a better place to live."

"Over the last 50 years of Surface Mining in Appalachia, the vast majority of mined land was originally forest," said Brent Wahlquist, director of OSM's Appalachian Regional Office. "It is our hope that through this initiative, perhaps 50 to 100 years from now it can be forest again, and be virtually indistinguishable from the rest of the landscape."

## Academic Team Holds Meeting

On May 16, 2005, the recently formed Academic Team held a conference call. The call was hosted by co-team leaders, Dr. Jim Burger of Virginia Tech and Dr. Don Graves of University of Kentucky. The Academic Team discussed its goals, the role of team members, and the items it hopes to deliver to support ARRI.

The main goals of the Academic Team will be to provide the scientific basis for reforestation procedures on surface mines and to be the research resource for ARRI and its stakeholders.

The role of the co-team leaders is to set the agenda, organize, and provide leadership for the Academic Team. The role of the

ARRI Core Team liaisons (Patrick Angel and Vic Davis) will be to facilitate, coordinate, and maintain communications within and outside the membership of the Academic Team. Communication and collaboration with each other is the main role of the individual team members. The increased communication will facilitate efficiency, minimize (continued on page 4)

## DR. GRAVES RECEIVES REFORESTATION AWARD

Dr. Graves is recognized nationally and internationally for making significant contributions through his research and extension work and for having devoted nearly all of his professional life to the improvement of surface mine reclamation.

The American Society of Mining and Reclamation has bestowed upon Dr. Donald H. Graves of the University of Kentucky the Society's prestigious Reforestation Award.

This special award has been given only once in the past to Dr. Clark Ashby of Southern Illinois University in 1998. Dr. Graves has dedicated his career – over 40 years – to the reforestation of surface mines

and his contributions to education and reclamation research cannot be summarized in a few sentences.

Dr. Graves is recognized nationally and internationally for making significant contributions through his research and extension work and for having devoted nearly all of his professional life to the improvement of surface mine reclamation. His vision has provided

concrete hope for the future of the forest industry in the United States and his efforts will lead to the betterment of society. Dr. Graves, accompanied by his wife Anita, received the Reforestation Award on June 21, 2005, at the Society's annual meeting in Breckenridge, Colorado. Please join us in offering our congratulations and appreciation to Dr. Graves.

## PA ARRI Presentation

On June 7, 2005, former ARRI Team Member Nevin Strock of the Pennsylvania Department of Environmental Protection (DEP), and Paul Yacovone of the Office of Surface Mining gave a PowerPoint presentation on the ARRI program and goals to 17 DEP personnel.

The group represented Permits Chiefs from all districts, reclamation plan reviewers, and reforestation designers from the Pennsylvania Aban-

doned Mine Lands Reclamation Bureau. The program took place at DEP Headquarters in the Rachel Carson Building in Harrisburg, Pennsylvania.

The presentation outlined the reasons for the establishment of the Initiative, and its importance to the Appalachian Region. The Initiative approach was discussed at length, and several ideas on how to further promote the Initiative approach were discussed.

Doug Saylor, who has replaced Nevin after his retirement as the Pennsylvania ARRI representative, was present for the session. He will be an asset to the ARRI, as he has over twenty years in forestry working for the Pennsylvania DEP. The two-hour presentation was well received by the group.



### 2005 RNRF Outstanding Achievement Award



## ARRI NOMINATED FOR RNRF AWARD

On May 2, 2005, ARRI was nominated by Brent Wahlquist, OSM's Regional Director of the Appalachian Region, for the Renewable Natural Resources Foundation's 2005 Outstanding Achievement Award (OAA).

The OAA recognizes a United States project, publication, piece of legislation, or similar concrete accomplishment in

the protection and conservation of natural resources.

The winner of the award will be selected based on how well they have: 1) Advanced the renewable natural resources sciences and public education; 2) Promoted the application of sound scientific practices in managing and conserving renewable natural resources; or 3) Fostered cooperation

among professional, scientific, and education organizations in the renewable resources fields.

The ARRI team has met all of these award level expectations with the recent Arbor Day tree planting events, combined with the implementation of the forestry reclamation approach and the partnerships that continue to be developed between government, industry and citizens groups.

# US Dept. of Energy's NETL Supports ARRI

On May 31, 2005, the US Dept. of Energy's National Energy Technology Laboratory's (NETL) Acting Director Carl Bauer signed a Statement of Mutual Intent to support the Appalachian Regional Reforestation Initiative.

Attending the signing in Morgantown were Joe Strakey, Ralph Carabetta, Kanwal Mahajan, John Litynski, Sean Plasynski, Sarah Forbes, and Linda Morton representing NETL. Also in attendance were members of the ARRI: Roger Calhoun, Director of the OSM Charleston Field Office; Brad Edwards, a Reclamation Specialist with OSM in

Morgantown; and Scott Eggerud, an Environmental Resources Specialist with the WV Department of Environmental Protection.

John Litynski opened the meeting with a brief overview of NETL and carbon sequestration projects related to reforestation. Attending ARRI members then briefly described the goals of the program and recent advancements in achieving them; including changes to the WV Department of Environmental Protection regulations to facilitate the use of ARRI practices in reclaiming mined lands.

NETL's membership in the ARRI is mutually beneficial. Terrestrial sequestration projects underway in NETL's Carbon Sequestration Technology Area are already aimed at reforesting mined lands to increase the uptake and storage of CO<sub>2</sub>. Membership also allows NETL to share knowledge with academia, and other ARRI members to advance carbon sequestration through mine land reclamation.



## ARRI and the American Chestnut Foundation

Representatives of the Office of Surface Mining (OSM), the Kentucky Department for Natural Resources (KDNR), and the University of Kentucky (UK) made a presentation to The American Chestnut Foundation (TACF) Board of Directors meeting at Bristol, Virginia on April, 16, 2005. The purpose of the presentation was to introduce the Appalachian Regional Reforestation Initiative (ARRI) to the board members and invite TACF to sign up as an ARRI partner.

The presentation included an explanation of the forestry reclamation approach, an update of ARRI accomplishments and goals, and a proposal for possible collaboration between ARRI partners and TACF.

The goal of TACF is to restore this venerable tree to its rightful position as the dominant tree of the eastern deciduous forests. UK researchers believe that the forestry reclamation approach, as advocated by ARRI, creates an ideal



**TACF photo example of Chestnut trees it hopes to restore to Appalachia**

growth medium for the American chestnut. Fresh, loose graded spoil is devoid of competition and the root fungus that attacks the tree seedlings, and it has been shown that high quality hardwoods thrive

under the Forestry Reclamation Approach. It was proposed that ARRI and TACF could collaborate in locating qualified surface mines in the seven Appalachian coal states to serve as springboards for incorporation of this tree species into the eastern deciduous forests.

At the conclusion of the presentation, Mr. Marshal T. Case, President of TACF, signed ARRI's Statement of Mutual Intent. Mr. Case invited the representatives of OSM, KDNR, and UK to make a similar presentation at TACF's annual meeting in October 2005 in Lexington, Kentucky.

Attending the meeting were Marshal Case (President, TACF), Ray Hornback (KY Chapter, TACF), Herb Darling (Chairman of TACF Board of Directors), Paul Rothman (KY DNR), Patrick Angel (OSM), Dr. Chris Barton (UK), Rex Mann (USFS, KY Chapter, TACF), and Phil Pritchard (Development and Special Projects Director, TACF).

## ARRI Reforestation Field Trip and Meeting

By Mike Hiscar and Pete Hartman

A group of state and federal employees who are the Appalachian Region Reforestation Initiative (ARRI) team toured several sites throughout the region on August 8 - 12, 2005, along with representatives from Virginia Tech, West Virginia University, and University of Kentucky and other academia. The purpose of the tour was to view different areas that had been reclaimed through reforestation. The following is a discussion of the areas toured.

### Cantenary Coal Company

The ARRI field trip began in Southern West Virginia at the Cantenary Coal mountain top removal permit located south of Charleston, West Virginia. This site consists of over 9,000 permitted acres. The permit toured is an approved Experimental Practice that compares mine soils, parent materials, compaction rates and ground covers for reforestation purposes. The research is being done in conjunction with West Virginia University and the West Virginia DEP.



### Trees planted spring of 2005

Commercial forestry plots included such species as white ash, red and white oak, yellow poplar, sugar maple and black cherry. The project includes annual monitoring of the percentage of ground cover, observation of volunteer growth, and invader species. Tree survival rates, heights, soil analysis, and climatic conditions will be monitored throughout the study period.

Tree growth on the demonstration plots which had no topsoil and were either rough graded or minimally graded, was found to be very good. Very little mortality was noted. The area is characterized by

relatively flat areas and slopes with a 2:1 ratio.

### Starfire, University of Kentucky

The Starfire site, located outside Hazard, Kentucky, consists of a series of older demonstration plots that were established by Professor Don Graves of the University of Kentucky. The plots are within an area where active surface mining operations are being conducted, and the State of Kentucky has re-established an Elk herd on the reclaimed area.

Various reclamation methods have been used with different spoil-handling techniques. Data has been collected on uncompacted (loose-dumped), rough graded, tractor-ripped, and dozer-ripped soils. Data collected at Starfire has shown that compacted soils result in high tree mortality rates, lower growth rates, and lower site productivity.

At this site, the tree species such as white pine, yellow poplar, and white oak, (Continued on page 5)

## Academic Team Holds Meeting (continued from page 1)

redundancy and promote unification within the research community.

In support of ARRI, the Academic Team decided to hold an annual research meeting in order to share research results with all ARRI participants and stakeholders. The first meeting to be held in May 2006 will feature an indoor research conference combined with an outdoor demonstration/field trip event, and a follow-up business meeting exclusively for the Academic Team.

The Academic Team plans to provide

content for the research section of ARRI's web site. This portion of the website will contain proceedings from the annual meeting, research reports, and descriptions of on-going studies.

The Academic Team is also planning to publish a series of technical bulletins (called Forest Reclamation Advisories) to explain and illustrate in a non-scientific manner the whole spectrum of reclamation technology as understood and practiced at this time. The tar-

geted audience will be the practitioners of reclamation technology. Each topic will be written as if it were a chapter in a book and at the end of this process the bulletins will fit together to form a compendium of practical reclamation technology.

Participants in the Academic Team call were: Dr. Jim Burger, Dr. Don Graves, Mr. Patrick Angel, Dr. Clark Ashby, Dr. Chris Barton, Dr. David Buckley, Dr. Jennifer Franklin, Dr. David Hix, Dr. Doug Jacobs, Mr. Ron Rathfon, Dr. Jeff Skousen, Dr. Rick Sweigard.

## ARRI Reforestation Field Trip (continued)

were found to be doing very well. Forest harvesting practices were discussed at the site regarding accessibility over large, uncompacted spoil ridges.



**8-year-old trees planted in uncompacted spoil**

### **Bent Mountain, Kentucky**

The third site visit was at Bent Mountain near Pikeville Kentucky. Research is being carried out at the site by University of Kentucky foresters, hydrologists and soil scientists. The research involves planting trees on a variety of sites which involve the placement of uncompacted,



**Trees planted in end dumped brown sandstone**

rough graded, compacted, tractor- ripped, and dozer-ripped soils. Material has been placed in different cells by adjacent mine operators as part of a mountain top removal operation.

In addition to the research being done on tree growth, researchers are also involved in looking at the hydrologic impacts and water quality associated with the various types of spoil placement methods. Preliminary findings have shown that runoff and sedimentation rates are substantially lower for loose dumped spoil areas and ripped areas compared to traditional reclamation techniques.

### **Powell River Project-Virginia**

The Powell River Project is located in Wise County, Virginia. It is a cooperative project between the Virginia coal industry and Virginia Tech, who have been doing research addressing reforestation since 1980. The tour visited research plots that showed the correlation between compaction and tree growth. Mine soil compaction caused by excessive grading has been shown at Powell River to



**Powell River Project**

seriously decrease reforestation success and long term forest health and productivity, while having no detectable erosion- limiting effects.

Virginia Tech's research shows that in nearly all cases, any mix of the surface ten feet of soil and rock makes an excellent growth medium for virtually all native species of pines and hardwoods. Applying at least four feet of this mix of material without compaction creates a topsoil substitute that is usually as productive as, or more productive than the original soil.



Appalachian Regional Reforestation Initiative

**ARRI Core Team Leaders:**

Paul Rothman, Kentucky DNR  
 Scott Eggerud, West Virginia DEP  
 Linda Keene, OSM AVS Office  
 Mike Bower, OSM Appalachian Region

**Academic Team Leaders:**

Dr. Jim Burger, Virginia Tech  
 Dr. Don Graves, University of Kentucky

**Academic Team Liaisons:**

Patrick Angel, OSM London Area Office  
 Vic Davis, OSM Knoxville Field Office

The Appalachian Regional Reforestation Initiative was started in 2004 with the goal of encouraging the planting of high-value hardwood trees on reclaimed coal mine sites using the Forestry Reclamation Approach. The initiative is a coalition of the States of the Appalachian , the Office of Surface Mining and their partners in industry, environmental organizations, academia, local, State and Federal government agencies and local citizens who have come together to support this valuable initiative.

**For more information on ARRI see our website at: <http://arri.osmre.gov/>**



## Tours of FRA Research Sites

Patrick Angel has been instrumental in arranging tours of the FRA re-search sites in Kentucky .

On July 7, about 30 high school and middle school science teachers from all over Kentucky were given a tour of the reforestation research on the Starfire mine.

During the week of July 11 – 13, Upwards of 30 state and federal inspectors from Kentucky and West Virginia visited Starfire and Bent Mountain.

Tennessee OSM inspectors also visited Kentucky for a reforestation field trip during the week of

July 18.

These tours are extremely helpful in allowing participants to visualize the FRA approach and actually see the on-the-ground results.

This is particularly helpful in overcoming cultural barriers toward implementing FRA.