

Oklahoma Innovations Radio Show

Air Date: October 25, 2009

Guests: **Tom Hennessey** and **Rod Will**, Oklahoma State University (OSU) Department of Natural Resource Ecology and Management (NREM)

[Music]

From the OCAST Radio Network, this is *Oklahoma Innovations*, a weekly science and technology radio magazine brought to you as a service of OCAST, the Oklahoma Center for the Advancement of Science and Technology. OCAST is the state's only agency whose sole focus is technology, its development, transfer, and commercialization. OCAST mission is to identify and fund promising research in technologies that allow Oklahoma to compete in a global market economy from our own backyard. This program features some of the state's most gifted and talented scientists, inventors, entrepreneurs, manufacturers, and business leaders who all have one common goal, developing technology-based economic growth for all Oklahomans. Now here are your hosts, Gary Owen and Steve Paris.

>> **Gary:** I'm in the mood for S&T. That's science and technology.

>> **Steve:** I'm glad you are explained that.

>> **Gary:** That's right. How are you buddy?

>> **Steve:** Doing well, Gary. And you?

>> **Gary:** I'm feeling much better. Thank you. Can you tell by the tone of my tone?

>> **Steve:** Yes. You sound great.

>> **Gary:** Yes.

>> **Steve:** And I'm a little stopped up this morning and I'm going to blame the thing that is probably the wrong kind of thing.

>> **Gary:** It's probably the trees.

>> **Steve:** Well it may be trees. I am allergic to red cedars. Were going to talk about red cedars today.

>> **Gary:** Yeah. We're going to talk about a lot forestry issues, aren't we?

>> **Steve:** You know Oklahoma is blessed to have a strong forestry industry.

>> **Gary:** Right.

>> **Steve:** We're going to talk about that here in just a little bit. We've got a couple of guests from Oklahoma State University who are going to tell us some things that I bet will surprise you.

>> **Gary:** You know if you travel different sectors of our state, you will see we have wonderful forestry.

>> **Steve:** Yes.

>> **Gary:** My favorite part is the southeast part of the state.

>> **Steve:** Of course.

>> **Gary:** I love that part of the state.

>> **Steve:** That is the western most end of the Great Southern Pine Forest.

>> **Gary:** Really?

>> **Steve:** And we have a very small percentage of the Great Southern Pine Forest in Oklahoma but we have it you know in spades down in southeastern Oklahoma. And it is the mainstay of a very strong industry down there so we're going to talk about that. What it means to us, and what it's going to mean for a future.

>> **Gary:** And our guests actually got some funding from OCAST didn't they?

>> **Steve:** Well, they did and.

>> **Gary:** We'll talk about that too.

>> **Steve:** We'll talk about that and what that's – that's more on the red cedar issue. Which you know, red cedar is one of those trees that they're kind pretty when you look at them.

>> **Gary:** But they're a pain in the neck.

>> **Steve:** But they're a pain in the neck they. You know they create a lot of economic problems, a lot of the health issues and we're going to talk about that and some potential ways that we may remediate that problem.

>> **Gary:** Any other projects that we should know about at OCAST?

>> **Steve:** Yeah. Probably every one of them. There's lot of things.

>> **Gary:** We try to drop in a guest every now and then that's been funded by OCAST.

>> **Steve:** Well, we do.

>> **Gary:** Or related to OCAST, anyway.

>> **Steve:** Exactly. And that of course that's not a prerequisite for being on this show but we have over in the biotech area in central Oklahoma around in the Oklahoma City area we have lots of companies that are doing some wonderful things. One of the things that's been amazing to me is the ability it just seems like it's on a huge roll right now probably has something to do with stimulus money. But it seems like a lot of our private sector companies and a lot of our foundations are attracting an unusually large amount of research dollars from the different federal institutions and federal organizations and of course that's good for Oklahoma. The more research dollars we can bring into the state the better off each one of us is economically so we like to see that happening.

>> **Gary:** Well in our science and technology news around the world this week. Some researchers are probably should say explorers are saying the north pole may turn into an open sea during summer within a decade according to some data released this past week by a team of explorers who trekked through the arctic for three months. The Catlin Arctic Survey team led by explorer Pen Hadow measured the thickness of ice as it sledged and hiked through the northern part of the Beaufort Sea in the north pole earlier this year during a research project. They're findings show that most of ice in the region is first-year ice that is only around 1.8 meters, that's 6 feet, 6 feet deep and will melt next summer. That's what they're saying. Now, oh, my.

>> **Steve:** Oh, my.

>> **Gary:** Know that's kind of scary; isn't it? The region has traditionally contained thicker multiyear ice which does not melt as rapidly. So it kind of –

>> **Steve:** So the Beaufort Sea may be getting bigger and bigger –

>> **Gary:** That's what they're saying.

>> **Steve:** Okay.

>> **Gary:** The Midwest and northern United States are likely to get a warmer winter while southeast can expect just the opposite, cooler and wetter conditions. Now, this is interesting of course El Nino is playing a big role in helping some drought parched regions, forecasters say wetter winters for Texas, Florida, and California and the southern parts of New Mexico, Arizona, and Louisiana, Mississippi, Alabama, Georgia and South Carolina. Hawaii to the Pacific Northwest and part of the Midwest Michigan to Arkansas are more likely to be drier than normal because of fewer storms across the Appalachian mountains. They didn't mention Oklahoma.

>> **Steve:** They didn't, did they?

>> **Gary:** So I don't know. So we're going to fall somewhere probably in the middle. They did say September was warmer than normal more for the U.S. but not greatly hotter than normal so I don't know folks. European astronomers have found 32 new planets outside our solar system. Adding evidence to the theory that the universe has many places where life could develop. Scientists using the European southern observatory telescope didn't find any planets quite the size of earth or any that seemed to have a possible habitat life.

>> **Steve:** Okay.

>> **Gary:** Okay. But they're saying they are a little bit unusual but the announcement increased the number of planets discovered outside the solar system to more than 400. Six of the newly found planets are several times bigger than earth increasing the population of so-called super earths by more than 30 percent. Whatever that means. NASA is saying they're delaying its November space shuttle launch by four days to provide more breathing room for a test flight of its new rocket. Atlantis was supposed to lift off November 12 now the launch is targeted for November 16. NASA says the delay will make it easier to get the experimental Ares rocket flying. Okay. Hoping to better understand how a melting Antarctica could swamp the planet a NASA plane outfitted with lasers and ground penetrating radar made its first flight over the icy continent just recently. The DC8 left Punta – is it Punta Arenas, Chile, is that the way or Arenas?

>> **Steve:** Close enough for me.

>> **Gary:** Any way it's a Chile area on a mission to fly as low as 1000 feet over Antarctica. Like the NASA satellite that has provided shocking data on how quickly Antarctica ice is disappearing this plane will measure snow cover and ice thickness but it also has equipment that will enable scientists to see under the ice shelves, pardon me, measuring the water below. That will be interesting. Steve, has our innovations in history.

>> **Steve:** Thank you, Gary. I do have. On October 18, 1842 Samuel Finely Breese Morse, whose friends all called him Sammy or FB for short, laid his first telegraph cable in New York City Harbor between the Battery and the Governors Island. This is the same Sam Morse of Morse Code fame. It was in October 21, 1879, after 14 months of experimenting in Menlo Park, New Jersey, Thomas Alva Edison succeeded in producing a working prototype of the electric incandescent lamp. It could burn for 13½ hours. And on that same date in 1908, a *Saturday*

Evening Post advertisement offered a chance to buy, for the first time, a two sided record. It was on Columbia on October 21, 1965 the Nobel Prize in chemistry was awarded to Robert Burns Woodward his outstanding achievements in the art of organic synthesis. October 23, 1910, Blanche Scott became the first woman aviator. Blanche was known not as an aviator but as an aviatrix. She soared to an altitude of 12 feet over Fort Wayne, Indiana. October 24, 1861, telegrams were sent coast to coast for the first time in the U.S. California justice Steven J. Field was the first in line to send a message. The recipient was President Abraham Lincoln. October 24, 1939, women's nylon hosiery went on sale for the first time at Wilmington Dry Goods in Wilmington, Delaware. Why Wilmington? Well, the DuPont Company, the inventor of nylon is based there. And it was on October 24, 1982, EPCOT Center was dedicated by Disney chairman E. Cardon Walker at Walt Disney World, Florida. He said may EPCOT Center entertain, inform, and inspire and above all may it instill a new sense of pride in man's ability to shape a world that offers hope to people everywhere. Know what EPCOT Center stands for?

>> **Gary:** Let's see. I did know.

>> **Steve:** Okay.

>> **Gary:** But I forgot.

>> **Steve:** Okay. Experimental Prototype Community of Tomorrow.

>> **Gary:** Yes.

>> **Steve:** And those, Gary, are just a few of the remarkable innovations in history for the month of October.

>> **Gary:** I wonder how many people really did know that. They just thought it was EPCOT, you know, they didn't ever understand what the letters stood for.

>> **Steve:** I know. It's one of those things I bet few know.

>> **Gary:** Couple of medical notes here. Scientists say they've grown a piece of heart muscle and then watched it beat by using stem cells from a mouse embryo. They're saying a big step toward one day repairing damage from human heart attacks. Wouldn't that be fascinating. Doctors say they have lots of treatments of course but what they're saying once one strikes there's no way to restore the heart muscle it kills and gradually the weakened heart quits pumping properly. This type of experiment could lead doctors to regenerating damaged heart muscle and they're saying it could be the holy grail in cardiac care. Wouldn't that be fascinating? And a side note here from researchers saying giving babies Tylenol to prevent fever when they get childhood vaccinations may backfire and make the shots a little less effective. It is the first major study to tie reduced immunity to the use of fever lowering medicines although the effect was small and the vast majority of kids still got enough protection from vaccines the results make a compelling case against routinely giving Tylenol right after vaccinations. Isn't that interesting? Well how much time do we got, Tom? Got about two minutes to introduce our guests and talk about – kind of tease our audience about what we're going to talk about.

>> **Steve:** Sure. By the way, if you're a student out there and interested forestry you need to listen to this show. We're going to talk about that even. Thomas Hennessey, Dr. Hennessey he's a professor of forest biology at Oklahoma State University has an interesting history. And we're going to also introduce Rod Will in just a minute. But, Thomas, you've been a part of the OSU team for I don't know how long but tell us a little bit about your history.

>> **Dr. Hennessey:** Well, my doctoral degree was from Iowa State. And I came to OSU to teach a course called forest dendrology which is identification of woody plant. I must confess I did not know a lot about Oklahoma forests.

>> **Steve:** Okay.

>> **Dr. Hennessey:** And probably had a vision of eventually moving out west where there are real trees.

>> **Steve:** Yeah. Like out in Colorado.

>> **Gary:** Like Smokey Bear out there.

>> **Dr. Hennessey:** Subsequently learned that there is a substantial forest community and interest in this state.

>> **Steve:** Very good.

>> **Dr. Hennessey:** And I have tried to work in that area for many years.

>> **Steve:** Out standing. And you've brought Rod Will came along with you. Dr. Rod Will who is also a associate professor I assume in the area of forestry at Oklahoma State University. I'll let you explain that, Rod, tell us a little bit about your history and what brought you to OSU.

>> **Dr. Will:** Well, I grew up in western New York in the worst of the snowbelt. Went to school at Cornell then got smart and went south.

>> **Steve:** Got out of the snow country didn't you.

>> **Dr. Will:** Virginia Tech and University of Georgia was on faculty at University of Georgia and then got really smart and moved to Oklahoma.

>> **Steve:** There you go. How long you been here?

>> **Dr. Will:** About four years ago.

>> **Steve:** Okay.

>> **Gary:** Wow.

>> **Steve:** And both of you gentlemen are on the faculty at Oklahoma State University: Do you both do a lot of teaching?

>> **Dr. Will:** We both teach courses there.

>> **Gary:** In addition to your researching.

>> **Steve:** That's something some people might not understand –

>> **Gary:** Right.

>> **Steve:** – is that the professors do a lot of research in addition to teaching and it's not just a one dimensional thing you do. You cover all those bases and then of course that's what gives you a lot of good background.

>> **Gary:** That's right.

>> **Steve:** Very good. So both of you are transplants one from Iowa and one from New York. Well, welcome to Oklahoma. We're glad to have you here.

>> **Gary:** Well, we have a lot of projects to talk about with you guys because the research you're doing I think is fascinating. I mean anything related to, in my opinion, nature is interesting but in Oklahoma sometimes a challenge I guess. Especially with the landscapes that we have and the diversified landscapes that we have and so we're going to talk more about the forests of Oklahoma and that includes innovation in forest products and how they're research is helping to create innovation in industry in Oklahoma. More to come on *Oklahoma Innovations*.

[Music]

As you drive across Oklahoma you can see thousands of gas wells sprinkled throughout the countryside. Many of these wells don't produce enough natural gas to justify pipelines. But without this access thousands of well sites are abandoned. With the support of the Oklahoma Center for the Advancement of Science and Technology one company is creating a portable device transported on a flatbed truck to process natural gas at well sites. This technology optimizes the amount of gas that can be captured and releases no bi-products into the atmosphere. This idea provides new opportunities for small oil and gas producers while bringing us one step closer to energy independence. Supporting innovation. That's what OCAST is all about. OCAST is looking for small business owners serious about investigating new products, services, and processes for more information call OCAST Toll Free at 866-265-2215 or visit their website at ocast.ok.gov. Investing in research and development it pumps new life into Oklahoma's economy.

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[Music]

>> **Gary:** It is called Natural Resource Ecology and Management, NREM, is what we're going to talk about this segment on *Oklahoma Innovations*. Our guests Rod Will and Tom Hennessey. They are professors and OSU and we're going to be talking a lot about research in forestry. Let's rock with NREM first.

>> **Steve:** Let's do that. And, Tom, you were the department when NREM started. Natural Resource Ecology and Management. Give us the overall concept of that program.

>> **Dr. Hennessey:** Yeah. I was fortunate to serve as NREM head for a period of time. The department was formed in 2007. Our goal was to get together many of our faculty who have expertise in natural resources, ecology, conservation.

>> **Steve:** At OSU you're going to find a bunch of those, right?

>> **Dr. Hennessey:** Well, in fact there are. And essentially what we brought together were folks for the different disciplines to include fisheries, forestry, rangeland, and wildlife.

>> **Steve:** There you go.

>> **Dr. Hennessey:** You get under one umbrella.

>> **Steve:** Good. And so that was the beginnings. That was the origin. And how does it better serve the state of Oklahoma better than the way it was structured before?

>> **Dr. Hennessey:** Well, one of our goals was to try to promote interdisciplinary teaching and research.

>> **Steve:** And you kind of touched on that, didn't you? You tried to get them all together.

>> **Dr. Hennessey:** Get them under one roof. Opportunities to better understand what each of the others were doing. But an opportunity to capitalize on the expertise and maybe form a synergy.

>> **Steve:** Yeah.

>> **Dr. Hennessey:** To work towards a common goal of conservation, sustainable resources for Oklahoma and beyond.

>> **Steve:** Of course. That's all so very important. Rod, I'm sure there's people out there who are thinking about or listening tonight today and thinking about okay I'd like I'd like to study forestry. I'd like – that might be my future. And you all have all kinds of opportunities for those students who might have some aptitude for that. What would you tell a student who might consider a degree in NREM? What would be your advise for them.

>> **Dr. Will:** Come visit.

>> **Steve:** Okay.

>> **Dr. Will:** Get in contact. Visit the website. Get in contact with some of the folks in the department. The range of opportunities is huge. And with the new department the interdisciplinary nature is very important. The questions that are important out there now deal with more than one discipline.

>> **Steve:** All right.

>> **Dr. Will:** You're looking at how forests affect water and wildlife. All these things come together. But for students the website is a great resource and contact us. We're looking for students interested in tackling some of the big conservation and natural resource issues and learning about those issues.

>> **Steve:** Now you'll probably be looking for students who have a good background high school and junior high with sciences, right? Although I'm sure that's not a prerequisite.

>> **Dr. Will:** Yeah. Science and just an interest in outdoors, natural resources, conservation. You know if you like forests and prairies and fishing.

>> **Steve:** You're the guys to see.

>> **Dr. Will:** We're the guys to see.

>> **Steve:** Okay. Very good. Let's talk about research as it relates to NREM. You know there's – I know there's lot – I've read about a lot of your projects we're going to talk about some of those a little later on but what types of things does the NREM program touch. Give us either one of you give us some ideas.

>> **Dr. Hennessey:** Well, earlier I mentioned four disciplines so let me just give you some examples.

>> **Steve:** Okay.

>> **Dr. Hennessey:** For example in forestry we might be looking at projects to development of management practices to try to overcome drought. To overcome nutrients deficiencies in soils. So we might be looking at opportunities to create schemes for fertilization. Promote forest

productivity. Another example in forestry would be our work in as related to water. Understanding the influence in commercial. Harvesting, for example.

>> **Steve:** It has an impact on your water sheds, doesn't it?

>> **Dr. Hennessey:** Absolutely. Water quality and water quantity in terms of sediment load. Looking at opportunities for forests to serve as buffers to nonpoint source pollution and that sort of thing.

>> **Steve:** You know there's a very important thing too that's often overlooked. I don't know if you were going to overlook it or not but where we get our oxygen.

>> **Dr. Hennessey:** Right.

>> **Steve:** Comes from predominantly from trees and comes from plants in the sea. It comes I guess from a lesser extent from the grasses and the weeds and other things like that. But the forestry – the forested areas are really what make it available – what make oxygen available to people, right?

>> **Dr. Hennessey:** Well, we enjoy the oxygen they produce. We drink the water that they cleanse. We enjoy the wildlife that they provide the habitat. And we enjoy their beauty in our communities.

>> **Steve:** And they soak up some of that carbon dioxide that we put out.

>> **Dr. Hennessey:** Absolutely.

>> **Steve:** Okay. Yeah. Rod you raised your hand. You got something you want to say?

>> **Dr. Will:** That's my point is that more so than oxygen taking up CO₂ from the atmosphere is probably a more important service at this point in time.

>> **Steve:** Yeah.

>> **Dr. Will:** And we don't appreciate how much CO₂ is taken up by forests and by natural systems.

>> **Steve:** Yeah. The cleansing process that Tom mentioned. Tom, go ahead.

>> **Dr. Hennessey:** Might just mention a couple of other you asked about kind of research. Certainly in our rangeland program we have landscape kind of projects looking at opportunities to restore native grasslands or prairies. Large projects up at the Tall Grass Prairie.

>> **Steve:** Oh yeah. The Osage country.

>> **Dr. Hennessey:** Yes. Creating habitat which will benefit our bison. Wildlife we have some programs statewide programs looking at upland game management particularly Bobwhite Quail.

>> **Steve:** Oh, yeah.

>> **Dr. Hennessey:** And restoration of those habitats trying to bring those populations back. And finally I might just mention in the area of wetland ecology we're looking work to restore native wetlands for all the ecological benefits they provide us.

>> **Steve:** Exactly. We've had to over the years change some of our philosophies about how we treat the land because some of the things that man has done not all things but some of the things

have been detrimental over time and now that we know that we're going back and changing that; are we not?

>> **Dr. Hennessey:** Right.

>> **Steve:** So. So there's lots of areas for students who want to go to Oklahoma State University and study this field of endeavor. There's just so many ways and you touched on fish, barely, but that's involved here to, right?

>> **Dr. Hennessey:** Well, absolutely. It affects the habitat. It affects the predator fish undesirable fish populations we're talking about bass we are talking about bluegill whatever it is. How do we better manage those populations those habitats and again that directly relates back to water quality kinds of issues and so in terms of students one of the things that we pride ourself on is we have broadly trained graduates and what that means is they have opportunity to seek employment in federal service whether it's forest service Bureau of Land Management. Could be with private industry. Could be with conservation groups. We try to send out graduates who have that broad expertise.

>> **Gary:** We're talking with Rod Will and Tom Hennessey from OSU and we're talking about some of the research they're doing in forestry. And when we return we're going to find out one of the OCAST projects. One of the projects I should say that was funded by OCAST was involved when we return on *Oklahoma Innovations*.

[Music]

There's more to learn on *Oklahoma Innovations* with Gary Owen and Steve Paris on the OCAST radio network.

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[Music]

>> **Gary:** Our in-studio guests this week are Rod Will and Tom Hennessey. They're professors in forestry at Oklahoma State University in Stillwater. And I want to make a side note here about Tom Hennessey. Recently he was awarded the prestigious honor of Fellow by the Society of American Foresters. Now you say so. Well approximately 5 percent of SAF members attain the rank of Fellow which honors lifetime achievement to the forestry profession and outstanding contributions to the organization. So salute to you, sir. Congratulations.

>> **Dr. Hennessey:** Thank you.

>> **Steve:** Got him here in Oklahoma. Brought him from Iowa.

>> **Gary:** That's right.

>> **Steve:** And now this is home.

>> **Gary:** Now we're going to talk about red cedars what I understand is not a native.

>> **Steve:** It is native.

>> **Gary:** It's native to Oklahoma? I didn't think it was okay all right well.

>> **Steve:** There's a lot of misinformation out there and I'm guilty of putting out some of it. But red cedars have a history in this state. And some of it's kind of negative but there are some positive sides too that we're going to talk about. I think Rod probably we want to talk to you right now. Give us an overarching view of red cedar and what it means to our state.

>> **Dr. Will:** Sure. Red cedar is native. Previous when fire was very common the landscape was pretty much stuck or stayed in areas that doesn't have enough fuels to burn. So areas that were rocky. Areas in canyons. But with wide scale fire suppression red cedar has since moved out on to the landscape.

>> **Gary:** Yeah.

>> **Dr. Will:** And it is invading our native prairie as well as some of our forest midstories. It's estimated about 8 million acres in Oklahoma have been infested with red cedar.

>> **Gary:** Wow. So is this like the weed of trees in a sense?

>> **Dr. Will:** It is. It's easy to control.

>> **Gary:** Is it?

>> **Dr. Will:** You burn it.

>> **Gary:** Yeah.

>> **Dr. Will:** But unfortunately the way to landscape is fragmented and people's attitudes towards fire is such that not everybody can burn.

>> **Gary:** Right.

>> **Steve:** But you're going to lose a barn every now and then. You're going to lose a house every now and then because fires are not always that easy to control sometimes.

>> **Dr. Will:** Well with safe prescribed burning.

>> **Steve:** Know what you're doing.

>> **Dr. Will:** It can be. But unfortunately people's attitudes towards burning is such that they choose not to use prescribed fire.

>> **Steve:** You mentioned the 8 million acres. I think I read something in your material that means that there are about 250 red cedars per acre on that heavily infested landmass. Is that right?

>> **Dr. Will:** Correct.

>> **Steve:** Okay.

>> **Dr. Will:** And the problem's getting worse. You know if you drive up and down I35.

>> **Steve:** You see it.

>> **Dr. Will:** You see it all the time.

>> **Steve:** You bet.

>> **Dr. Will:** Even between years you can see the infestation getting worse.

>> **Steve:** Now that has an impact on our water supply. Does it not?

>> **Dr. Will:** Sure. Lots of things. Water, forage for cattle, hunting opportunities, and the risk of wild fire gets a lot worse. The big fires this past winter you could see when it hit the patch of red cedar it would just torch up.

>> **Steve:** Like an explosion.

>> **Dr. Will:** Right.

>> **Steve:** You bet and the water we talking about that just very briefly but it's my understanding that red cedar really soaks up a lot of ground water. A phenomenal amount.

>> **Dr. Will:** We don't know for sure. There's some estimates that it's true. And there is some other research that we have going on currently in NREM which is actually to quantify kind of watershed water use by areas with and without red cedar. So we should have a definitive answer on that but probably, yes. Probably, yes.

>> **Steve:** There's research going on and I think you may be involved in this – forgive me if I misstated that – but along to North Canadian River which is the Oklahoma River in Oklahoma City but the North Canadian River in the northwest and they're looking at how much impact cedar trees have that are located along the river and how much water they take out of the ground which eventually comes out of the river. Are you all aware of that research project?

>> **Dr. Will:** I am.

>> **Steve:** You're involved in it?

>> **Dr. Will:** I'm not involved in it.

>> **Steve:** Okay. I don't know what the status of is on it but we'll find out.

>> **Dr. Will:** Yeah and that's a little bit different because there the roots are tapped right into the river.

>> **Steve:** Right.

>> **Dr. Will:** And so the water use is unlimited or water potential is unlimited. We don't know how much water they're using out where they've invaded the prairie system.

>> **Steve:** Right exactly.

>> **Gary:** So do we have a resolve if we're to say go out and just take and harvest red cedar and make it into a profitable industry like I mean I know mulching I guess would be one of the first things you'd do but are there other products that can be evolved out of red cedar in Oklahoma where we can make it an industry here in our state?

>> **Dr. Will:** Well, it's tough. Because the red cedar that's out in the prairies does not have a form which lends itself to using structural –

>> **Steve:** Oh, okay. So it's different than what's along to riparian areas.

>> **Dr. Will:** When red cedar grows with competition like in a forest canopy or in a forest it tends to have nice straight bole or stem which can be processed into wood and lumber. But when it grows in the prairie if you take a look they look to me like big cabbages out there.

>>: Yeah.

>> **Dr. Will:** And it's pretty thinly branch and mainly leaf. And for a solid wood product that's useless.

>> **Steve:** Yeah.

>> **Dr. Will:** And even for the solid wood product there's just not a huge market out there for red cedar beyond specialty products.

>> **Steve:** Well and there are also other issues like transportation and you know you got red cedar all over a big part of the state. Getting it to a processing location involves transport and that's expensive.

>> **Dr. Will:** Yes. Probably the biggest area for red cedar processing probably is near Springfield, Missouri in the Ozarks and there are some areas within Oklahoma as well that do some small scale processing.

>> **Steve:** Yeah. I think there's been some research or there is some research underway about taking progressing facilities that are transportable to areas and then dealing with the red cedar in that area and then moving to another location. I don't know where that is but these are things I've been hearing about for some years now but I don't know what the conclusion are on them. So maybe you can shed some light on that.

>> **Dr. Hennessey:** Well, other people have look in for example extracted what they call cedar oil.

>> **Steve:** Right.

>> **Dr. Hennessey:** The aromatic compounds out of that which is used as a base in soaps and perfumes and so forth, animal – chips for animal bedding.

>> **Steve:** We've all seen that advertised. The cedar chip bed for your dog not have flees and things like that.

>> **Gary:** Is it good for a mulch?

>> **Dr. Will:** Good that you should ask that because you know we have that OCAST funded project that we started this past growing season looking at the characteristics of using red cedar mulch in horticultural and garden operations. There are several commercial processors here in Oklahoma which go out into an invaded pasture or prairie clip the trees let them dry and then mulch them and sell that commercially. And we've heard some landscapers or some folks who refuse to use or don't like to use red cedar mulch because they think it uses water or sucks up water or it has a bad influence on plants.

>> **Gary:** Interesting.

>> **Dr. Will:** And so that's kind of the genesis of why we proposed to do this research was to determine whether any of those notions were true or not. And we're testing things such as water underneath the mulches. Well, first of all we're looking at several mulches.

>> **Steve:** Right:

>> **Dr. Will:** Red cedar, Cyprus, pine bark nuggets, ground pine, and hard wood and comparing those to red cedar.

>> **Steve:** Now is there any thing in the cedar oil that is damaging to the plants you know you put it around plants you use it as mulch around another type of tree. What is the cedar oil what kind of impact does it have?

>> **Dr. Will:** We're not finding any negative affects. In fact it might have a positive affect.

>> **Steve:** Okay.

>> **Dr. Will:** Because there are some studies that show that insects do not like red cedar mulch. And so if you can keep termites away or you can keep ants or other critters away from your house or foundation.

>> **Gary:** That's a big one.

>> **Dr. Will:** That's a good thing.

>> **Gary:** Yeah no kidding.

>> **Steve:** There you go. So there's potential for increasing the forestry products in the state of Oklahoma and you're looking at that. And give us an idea of when you think you might have some resolution what would be the way to go. Of course that's a hard one to say. We're talking at some futuristic type looks here.

>> **Dr. Will:** Well the studies started this spring and we're wrapping up the first growing season and we have funding for another growing season. So we'll have some data worked this winter but we'll be done with the study in about two years.

>> **Steve:** About two years. Okay. We want to remember to have you guys back on to talk about that and see what you're findings were because that's fascinating information. Let's – is there any before we leave the red cedar subject I know we just touched on it – are there any other items you want to bring to us before we go into the kind of overarching forestry industry in the state of Oklahoma?

>> **Dr. Will:** What I see with red cedar is there's so much of it out there that the first priority should be to try and prevent the infestation.

>> **Steve:** Right.

>> **Dr. Will:** And once the infestation occurs then something like red cedar mulch might be an option for a small landowner to help clear the land.

>> **Steve:** Now the burning part of it. Are there people who actually do control burns to control red cedar? MR.: Yes. In fact NREM we have a very strong burning program and fire program which entails a lot of prescribed fire as well as natural fire.

>> **Steve:** Isn't it interesting how this is all transpired? We used to try and put out all the fires and now we're finding out there was a benefit for natural burning that would occur in nature that kind of kept nature in balance doesn't it.

>> **Dr. Hennessey:** No question.

>> **Steve:** Yeah. I think they found that out in a big way here 10, 15 years ago up at Yellowstone when they had the huge fire up there and so much understory that would have been cleaned out naturally had we allowed the burns to continue.

>> **Dr. Hennessey:** Yeah, that's true. But the good news story is if you haven't been there for a while and drive back there now you'll be amazed at the regeneration.

>> **Steve:** And the quality I bet.

>> **Dr. Hennessey:** That's come back. So it's part of the natural ecosystem. It can be catastrophic when it occurs but ecologically it serves an important role.

>> **Steve:** Those trees are much more healthy, right?

>> **Gary:** Rod Will and Tom Hennessey are our guests from OSU. We're talking about some forestry research going on there. We'll come back and talk with them more after we take this little break from *Oklahoma Innovations*. Don't go away.

[Music]

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[Music]

>> **Gary:** Thank you for joining us on this week's addition of *Oklahoma Innovations*. In Oklahoma red cedar used to only grow in rocky or moist areas a for cry from reality today where approximately 762 acres a day is lost to the trees. Red cedar invasion in Oklahoma grasslands

cost the state nearly \$450 million a year through lost cattle forage, catastrophic fires, reduced hunting leases, lost recreation opportunities, and as we've discussed even decreased water yield. Researchers with the Oklahoma State University's Division of Agricultural Sciences and Natural Resources are trying to do something about that. Our guests are Tom Hennessey who is a professor of forest biology at OSU, and Rod Will who's an associate professor. And in fact Rod recently got some funding from OCAST for one of his research projects.

>> **Steve:** Which we've been talking about. During the break we talked about what landowners can do to control red cedar. And one of the things they can do is burn but you know most of us are nervous about that we don't want to catch the whole countryside on fire. But you've got a way that people can learn how to do that who wants to talk about that? Tom, is that you?

>> **Dr. Hennessey:** Well, one of our faculty members in NREM at OSU is developing programs to create what we call burning associations and throughout the state going around and working with landowners to teach them how to safely burn.

>> **Steve:** Called control burns.

>> **Dr. Hennessey:** Prescribed burning and do it in a safe and prudent manner. So we're excited about those opportunities.

>> **Steve:** Sure. And if you want to learn how to do that you need to check the website.

>> **Dr. Hennessey:** Yes.

>> **Steve:** And do you have the website they can – you know what it is off the top of your head?

>> **Dr. Hennessey:** I can tell you if they just type in OSUNREM –

>> **Steve:** That will go there.

>> **Dr. Hennessey:** – it will come up.

>> **Steve:** Put it in your browser and check it out. Go ahead, Rod.

>> **Dr. Will:** Those burn associations go county by county. And how it works is that folks will band together and share resources.

>> **Steve:** There you go.

>> **Dr. Will:** So if you've got a truck that can hold a water tank and you bring that along. Someone may have a couple of grip torches they bring those along and people work together. It's neighbors with neighbors getting the job done.

>> **Steve:** There you go. It's a great idea.

>> **Dr. Will:** And I have to say you mentioned about the project, the OCAST project for red cedar mulch. And I can't take all the credit. It's a collaborative effort with Tom Hennessey here, Dr. McKinnely who is not here today and also Janet Cole.

>> **Steve:** Okay.

>> **Gary:** All right.

>> **Steve:** Very good. A prolific researcher. Her name pops up a lot. Very good. Let's go to the kind of overarching aspect of the forest industry. Red cedar is an important part and control it

and dealing with it. We have other areas of forestry that you gentlemen are involved in kind of give us a feel for just what forestry means for Oklahoma.

>> **Dr. Hennessey:** Well, 10 million acres of Oklahoma are forested, about 25 percent. Of that about 7.7 million acres is what we will classify as commercial forestland.

>> **Steve:** 7.7 million acres?

>> **Dr. Hennessey:** Yes.

>> **Steve:** Wow.

>> **Dr. Hennessey:** And I might point out that the vast majority of our Oklahoma forests are not owned by a the government they're not owned by private industry. They're owned by individuals.

>> **Gary:** Interesting.

>> **Steve:** Yeah. I think that probably the biggest at one time the biggest single landowner in the state of Oklahoma I believe was Weyerhaeuser but I don't know does that company still exist in the way it did?

>> **Dr. Hennessey:** Absolutely. I don't know about the acreage but certainly it still exists.

>> **Steve:** I think if I remember correctly at one time they had roughly 800,000 acres.

>> **Dr. Hennessey:** At one time.

>> **Steve:** At one time. I don't know what they have now. They've changed a lot in southeastern Oklahoma. But let's talk about the western end of the Great Southern Pine Forest which is predominantly where the commercial forested area is located. Is that right, Rob?

>> **Dr. Will:** Yes, that's correct. The southeast corner of Oklahoma does have and supports commercial loblolly pine plantations. And those can be very productive.

>> **Steve:** And you said loblolly pines.

>> **Dr. Will:** Loblolly pine.

>> **Steve:** I want to here about those.

>> **Dr. Will:** Grown in a plantation with intensive resource inputs you can exceed four tons per acre per year on some of those plantations.

>> **Steve:** Wow.

>> **Dr. Will:** So potentially very productive systems. It has a big impact to the state. In fact the latest number I saw was about \$2 billion to the sate of Oklahoma.

>> **Steve:** That's with a B. Two billion.

>> **Dr. Will:** Two billion. And that includes the resource on the stump but also the manufacturing and salaries that go out to people and so forth.

>> **Steve:** Sure.

>> **Dr. Will:** And now since with the housing collapse there has been a decline in some of the value of the saw timber but pulpwood is maintains a reasonable level at this point.

>> **Gary:** That's one of those cyclical events as in most industries whether it be forestry, automobile manufacturing. That will come back probably.

>> **Dr. Will:** When housing comes back the saw timber market will come back.

>> **Steve:** Sure. And growing a forest is not a short-term thing. That's a long-term planning operation. Now give us an idea of how that occurs. What's the training that goes on and preparing for the future and growing forests. Okay. I think what is it 35 years it takes to grow? I don't know what it takes any more.

>> **Dr. Will:** It's shorter now.

>> **Gary:** It's shorter that now.

>> **Steve:** Is that right okay?

>> **Dr. Hennessey:** We've captured – had programs in selection, genetic selection, to try and identify those trees that are fast growing and breeding programs to perpetuate those genotypes so it's come down from 35 years. It depends on what the landowner objective is but if it's growing fiber or saw timber, for example, it could be in the 20s now and we forecast some day in the not to distant future may be even in the teens.

>> **Steve:** Really? So a human could probably grow two generations of forest roughly. And of course if you plant different areas at different times you can kind of make it an ongoing process where you have different levels of growth in different plots of land.

>> **Dr. Will:** To achieve those growth rates takes genetically improved seedlings that Tom was talking about but also some pretty intensive inputs.

>> **Steve:** Right.

>> **Dr. Will:** In terms of there's tillage ahead of time. And there's herbicides to reduce competition, and there's fertilization as well.

>> **Gary:** And then you've got weather variables too. I mean you hope and you pray to you don't have a big drought issue, obviously.

>> **Steve:** Or ice storm.

>> **Gary:** Ice storm would wipe them out.

>> **Steve:** Ice storms do a lot of devastation.

>> **Gary:** They do.

>> **Steve:** You know let's talk about that just a minute. To a person, a tree farmer for instance, I don't know if they still use that term or not but that's the term from some years ago when they put a forest in other words usually right after it's been I guess well are you clear cutting? Is that still done?

>> **Dr. Hennessey:** Yes.

>> **Steve:** Okay and you go back and replant there's different stages where you can harvest those tree for example they'll get to maybe a fence post size or they can get to some other sizes and they cut out certain numbers of them and then let others grow until they become something that you can use for creating lumber for homes.

>> **Dr. Hennessey:** Well, there's an opportunity to capture some revenue along the way and improve the health of the forest. Pre-commercial thinning and then commercial thinning when you do get some revenue back and so on. So that's one of the things that our department is interested in trying to promote as I mentioned earlier that so many of our Oklahoma forests are owned by individuals but they do not have active forest management plans.

>> **Steve:** And they need to have that.

>> **Dr. Hennessey:** And we hope to be a resource along with the state of Oklahoma, Oklahoma Department of Agriculture Forestry Services –

>> **Steve:** That's right.

>> **Dr. Hennessey:** – plays an important role but so many of our forestlands could be more productive and even probably do more effectively job of reaching the objectives that the landowner might want in terms of visual in terms of wildlife whatever it might be through management.

>> **Dr. Will:** Every landowner doesn't need to do a plantation. That doesn't make sense for a lot of people who have objectives related maybe hunting or esthetic or like to hike. But with some management there's a probability to potential revenues from their land.

>> **Gary:** I have one quick question based on your research. Are you looking for landowners who are willing to provide opportunities for your research or do you all do you have pinpointed do you have places around the state where you already have research on going? I just know that different sectors of the state sometimes you go, boy, if we could get to that sector of the state with a landowner we could do some ongoing research. Do you have opportunities like that you're looking for?

>> **Dr. Will:** Weyerhaeuser is very helpful to us by providing –

>> **Steve:** Good.

>> **Dr. Will:** – research platforms.

>> **Steve:** And they've got a lot of acreage.

>> **Dr. Will:** They do.

>> **Gary:** Yeah.

>> **Dr. Will:** I think they're between 3 and 400,000 acres.

>> **Steve:** Which is roughly half of what they used to have not two decades ago.

>> **Dr. Will:** So they're very helpful and the forest service owns some land we can work on as well.

>> **Gary:** Excellent.

>> **Dr. Will:** Sometime we're hesitant to work with private landowners because land ownership changes.

>> **Steve:** Yes. And so you have to have some consistencies there. I want to talk about the genetic – go ahead, Tom.

>> **Dr. Hennessey:** I was just going to mention one place that we do like to work with what we call nonindustrial private forest owners relates to education and that's our students. Our student required to do a capstone project when they're seniors which gives them an opportunity integrate everything we think we've taught them –

>> **Steve:** Really.

>> **Dr. Hennessey:** – over the years and we do try to identify private landowners as a basis for student projects.

>> **Steve:** Great. We've down to the last 45 seconded so I want to ask you about the genetic aspect. How do you genetically improve trees in a kind of overarching sense. You still shoot those pine cones off those super tree?

>> **Dr. Will:** Well that take 45 minutes. But ODAF and OSU work in genetic improvement. And first the super trees were selected and now those seeds – basically those were cloned and from those clones seeds are produced and then planted out and they're continually improving.

>> **Steve:** Genetically improved tree?

>> **Dr. Will:** We keep making special crosses whose parents do well and try to make better and better.

>> **Steve:** And that's how you get that 35 years down to maybe the teens, right?

>> **Dr. Hennessey:** Well within our department we have work down at the molecular level. We're trying to identify those genes.

>> **Gary:** Got to go guys. We're out of time. Thank you Rod, Tom. Steve, we'll see you next week on *Oklahoma Innovations*. Have a good week.

[Music]

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