



# NEW MEXICO TREE FARM NEWS



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### Preface to This Issue

In March of last year I was approached by the United States Forest Service – Santa Fe National Forest staff to see if I would assist in their effort to provide the nation with the Capitol Holiday (Christmas) Tree from the Santa Fe National Forest. They asked for my assistance having heard my presentations on Christmas tree production and the New Mexico Christmas tree industry at our bi-annual field days in Mora and at local Society of American Forester meetings. Suffice to say this endeavor was quite complex and there were many challenges in order to find, harvest and transport the tree to Washington D.C. After discussion with the NMTF Executive Committee we felt this would be a good venue to publicize the New Mexico Tree Farm Program. Well that effort worked well with several statewide and national articles

being published on the New Mexico Tree Farmers efforts.

Two of the major challenges that they requested my assistance for included: 1) harvesting and preparation of the Capitol Holiday Tree for its trip to Washington, and 2) to help acquire the more than 65 companion trees which go along with the Capitol Holiday tree. These companion trees were for various Senate and House of Representative offices, USDA offices and the Supreme Court. Of the 65 trees, 21 came from New Mexico Tree Farmers and the Demonstration Forest at the Philmont Scout Ranch. Several of the articles in this issue are associated with these efforts.  
 – John Harrington, editor

### Greetings from the Chair

Hope that everyone is off to a good new year. You will read in this issue of the newsletter about the New Mexico Tree Farm Committee's participation in the National Christmas Tree companion tree program. Thanks to Dr. John Harrington for his efforts in getting the NM Tree Farm Committee involved in providing the sixteen trees that went to Washington D.C. from Tree Farms here in New Mexico. Any exposure our program receives is beneficial to promoting good forest management. Particularly on a national level many people think New Mexico is all desert so getting the word out that new Mexico has private forests that grow beautiful Christmas trees was worth the effort.



It certainly has been a dry winter. This year is now drier than 1996 when the Dome fire in the Jemez Mountains and the Lama fire in the Sangre de Cristo broke out at the end of April. Without significant moisture we are in headed into a severe fire season. Tree Farmers, and others, that have forest land need to review what they have done to provide defensible space around structures. Even if work has been done in the past it may be time to do more. In forestry the work is never done.

If you need more information on defensible space measures or are looking for contractors to do the work please contact your State district forest office or you can contact the Tree Farm Committee at (505)983-2064 or forester4life@AOL.com

Wishing everyone a safe Spring. Lets pray for moisture. – *Harry Morrison, NM Tree Farm Chairman*

**Chama Tree Farmers the Riveras and the Mundy's Help Make Christmas Happen in Our Nation's Capitol**  
**Joe Carrillo,**  
**EMNRD – Forestry Division, Chama**

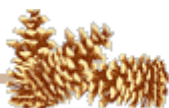
Trying to look for the perfect Christmas tree proved to be more of a challenge to State Forestry that expected. You would assume that professional foresters would know exactly where the best ones would be, but looking and finding took a bit longer than you'd think. Just when you see a great one, you look on the other side and its bald. You see an even better one down the hill, but alas it has a forked top. WAIT! There's one! Oh no it's too short. Um...no, that one has broom rust. Like I said, it took a lot more time than we anticipated, and a lot more miles. When we did find some, it was your local Tree Farmers, Mundy Ranch and Rivera Ranch that came through with some of the most gorgeous Christmas trees in the valley. And as Washington D.C. would come to find out some of the most beautiful in the nation.



*Craig Daugherty and Ruben Montes examine the largest of the companion trees to be donated, a 23 foot Englemann spruce from the Rivera Tree Farm.*

As you well know, the Capitol "Holiday" (**Christmas**) tree came from the Santa Fe National Forest. What you may not know, is that the tree was located in Rio Arriba County. State Forestry's Chama District assisted with preparing the tree for transport. Craig Daugherty, District Forester, and Joe Carrillo, Timber Management Officer both participated in binding the tree, or tying it down so it would fit on the trailer for its cross-nation trek to D.C. New Mexico was also responsible for providing sixty companion trees.

This provided a great opportunity to showcase private forestry at its best. Tree Farm members represent proactive owners of private woodlands, and their efforts to improve and maintain forest health sometimes go unnoticed. We wanted to make sure they got the recognition they deserved. Tree Farmers are not just those who "farm" groomed Christmas trees, they are stewards of forest management. With advice from agencies like New Mexico State Forestry, they learn how to best direct their timber resources, wildlife, and watersheds for the overall vigor of their resources. In the light of our current drought situation, this also translates into fire





protection.



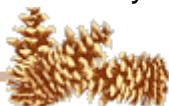
*The majestic 23-foot Englemann spruce Christmas tree harvested from the Rivera Tree Farm now placed in the USDA Courtyard.*

Henry and his son Mike Rivera were kind enough to show us their property. I was the first to venture into this ranch, which was also deemed a Tree Farm Demonstration Forest in 2004, along with owner Mr. Henry Rivera; we were able to locate prospective areas where the best formed trees would probably be found. After taking some GPS points, I returned to report the information to Dr. John Harrington with the NMSU Mora Research Station, and Mr. Ruben Montes with the USDA Santa Fe National Forest. During their visit to our Chama Valley, they were given the tours around the Mundy and Rivera Ranches.

Five 8-foot trees were donated from Mundy Ranch, and the Riveras donated a GRAND 23-foot Englemann Spruce. This twenty-three foot beauty was headed for the

US Department of Agriculture's indoor courtyard. What an impressive showing, for a tree coming from a private landowner, to be displayed in the department that oversees the US Forest Service. However, it took a bit of finesse and finagling to load this tree onto a 20-foot trailer. No cranes, no machines, just the talent of our District Forester, Craig Daugherty and his chainsaw! Fortunately with the mild winter we were still able to drive up to the Rivera Ranch, and up to the tree. Craig carefully planned his cuts so the tree would fall in the right direction. Trying to ease the tree down was not successful, but luckily it flopped directly onto the trailer. A huge sigh of relief came over us, as it would have been impossible to load it if Craig missed. Kudos go out to the sawyer skills of our District Forester. Now, to bind the tree seemed easy since we already helped bind the 80-foot National Christmas Tree, right? With a lot muscle and teamwork we rolled it up like a big green burrito.

Our agency's own Todd Haines, Bernalillo District Forester/former State Timber Management Officer, had the honor of going to Washington DC to hand out New Mexico Tree Farmer Christmas ornaments to each congress-person or representative who received a companion tree from a New Mexico Tree Farmer. During his stay, he attended a very high profile awards banquet at the USDA building in the indoor courtyard (where the Rivera tree was placed.) While in line for dinner, he happened to see a very distinctive place card that accompanied each New Mexico Tree Farm companion tree. Award recipients were having their photo taken in front of this magnificent tree, so it was receiving substantial but subtle attention. Todd had the foresight to approach the Director of the US Forest Service, Dale Bosworth and point out to him that the tree gracing the USDA courtyard came from the Rivera Family Tree Farm in Chama, New Mexico.





*Joe Carrillo, Susan Mundy and Reuben Montes stand in front of a white fir donated by the Mundy Tree Farm.*

New Mexico Energy Minerals & Natural Resource Department Forestry Division would like to thank Henry and Mike Rivera for their great contribution this past Christmas season, and would also like to express gratitude to the Mundy Ranch for their generous donation.

**An Evergreen for the Nation**  
**Darrell Pehr – New Mexico State University**  
**September 22, 2006**

The nation's Christmas tree will receive expert care from a New Mexico State University scientist for its month long trip from the Santa Fe National Forest to the west lawn of the U.S. Capitol.

John Harrington, superintendent of NMSU's Mora Research Center and chair of the Southwestern Section of the Society of American Foresters, will use special climbing gear to scale the 80-foot Englemann spruce just before it is cut by a U.S. Forest Service crew. Harrington will apply an antidessicant to keep the "People's Tree" from drying out during its tour of the state and cross-country trip to Washington, D.C.

"It will be on the road three to four weeks, so it will lose a lot of water," Harrington said. "The treatments will help it retain its moisture. It will look better longer."

Harrington is working with tree growers statewide, who are donating some of the "companion trees" that will decorate other federal offices in Washington. Donors Harrington is working with are members of the **New Mexico Tree Farmers**. Additional companion trees are being solicited from New Mexico Christmas tree retailers.

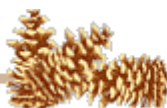
The companion tree project reflects the philosophy of forest management plans Harrington helps prepare for cooperating landowners: Selectively thinning the forest can reduce fire danger, improve forest health and generate income for entrepreneurs who sell trees during the holiday season.

"Either we thin the forest or nature will do it for us," Harrington said. The difference is that a forest fire will not be selective in deciding which trees stay and which go, he said.

Landowners who follow good forest management practices are getting good results. On one ranch near the research center, Harrington and rancher John Bartley spent an afternoon surveying the mixed-conifer forest of ponderosa pine, Douglas-fir and fir. Several white fir fit their criteria for a spot in the U.S. Supreme Court building: a flawless shape, a pleasing color and a height of about 30 feet.

Dolores Maes, U.S. Forest Service public affairs officer for the Santa Fe National Forest said the project should bring a lot of attention to the state's **tree farming** industry.

"The project is a way to highlight resources in our state and the people who make their living from those resources," she said.





## What Do People Look for in a Christmas Tree

*John Harrington – New Mexico state University – Mora Research Center*

Have you ever gone to a Christmas tree lot and everyone in your family agreed right off on the same tree? Probably not. The act of shopping for and purchasing a Christmas tree can be one of the most anticipated, joyful and frustrating rites of the holidays all at the same time. Everyone has their own vision of the ideal Christmas tree and with most visions each one is different. Usually our vision of the ideal Christmas tree is strongly rooted in our upbringing. The ideal tree vision often represents a happy memory from our past. The year you received the gift you had hoped for all year, or the special memory of going out with the family to the forest to harvest your Christmas tree, or the year your grand parents could make it to your house for the holidays. Regardless of why a particular tree is ideal we all have our own idea of perfection.

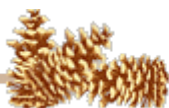
In the weeks preceding Christmas 2001, graduate students and employees in the NMSU – Mora Research Center Program undertook an ambitious consumer survey effort on the Christmas tree purchasing habits of New Mexicans. The survey basically asked what consumers were looking for when shopping for a Christmas tree. The survey area was restricted to four of more densely populated areas of the state, Albuquerque, Santa Fe, Las Cruces, and Roswell. Slightly less than 900 people were interviewed in nurseries and tree lots while they were shopping for Christmas trees. What will be presented here are the main attributes of a Christmas tree New Mexicans evaluate when purchasing a Christmas tree. But first, here is a brief history about the New Mexico Christmas tree industry.

Historically, New Mexico used to be a net exporter of Christmas trees. Traditionally, the Christmas trees were harvested from the naturally occurring forests in the mountainous

areas of the state. Some of these regions, such as Mora, Chama Cuba, Peñasco earned regional reputations of being centers for the sale of high quality Christmas trees. While many of the trees were exported to other more populated areas of the state, many more were exported to the treeless areas of neighboring states, primarily Texas, Oklahoma and Kansas. These tree sales provided an important economic input into these regions. However, increasing demand and associated over-harvesting of wildling Christmas trees in some areas led to a downturn in the New Mexico Christmas Tree industry in the early to mid 1970's. Now, New Mexico is a net importer of Christmas trees, primarily from the Pacific northwest and Great Lakes regions where Christmas trees are produced under intensive culture in plantations. The majority of New Mexico's plantation Christmas tree industry is associated with the production of Eldarica pine (a.k.a. Afghan pine) in the southern parts of the state.

Alright, now here is what we found out about consumer's Christmas tree purchasing habits. In a question we asked the respondents to rank by level of importance the following attributes: tree size, freshness, color, species, cost and other (write in your own response). What we found is that tree freshness was most important throughout the state, with the exception of respondents in Roswell who had freshness as least important. The second most important attribute was the size of the tree. In Roswell, Albuquerque, and Las Cruces, the cost of the tree was the next most important attribute. In Santa Fe the species of the tree was the third most important attribute followed by price. In the other three areas species was fourth following price. In most instances Douglas-fir was the most popular species. Color was the least important of the listed attributes. Only a few write in comments were generated in the "other" category and most of those were related to the shape of the tree.

While price was only ranked third in





importance, people indicated definitely spending limits. On average the consumers spent just over \$35.00 on a Christmas tree. This value was independently verified through a separate survey of Christmas tree retailers taken at the same time. How big an economic impact is this to New Mexico. Using population data from the 2000 Census, more detailed data from this survey on what consumers were spending on trees, and data from the National Christmas Tree Association on the number of households that have a real Christmas tree (about 48%) the value of the retail Christmas tree sales in these four municipalities is just over \$12.25 million. This is just real tree sales and does not include artificial trees or tree accessories.

Where did most of these Christmas trees come from? Only 19% of the Christmas tree vendors surveyed sold trees grown in New Mexico. Of the remaining 81%, the majority (over 90%) came from the Lake States (Wisconsin, Michigan, Minnesota) or the Pacific Northwest (Washington and Oregon).

If you are curious about raising Christmas trees as part of your Tree Farm management object and would like some help, please contact me here at the Mora Research Center via phone (1.505.387.2319) or e-mail at [joharrin@nmsu.edu](mailto:joharrin@nmsu.edu).

**Buchanan Christmas Trees Adorn  
Washington D.C. Congressional Offices  
Doug Boykin  
EMNRD – Forestry Division, Socorro**

On Nov. 16<sup>th</sup>, Socorro District Forester Doug Boykin, along with Dr. John Harrington from NMSU and Mike Kinney from New Mexico Department of Agriculture traveled to the Buchanan Ranch, 20 miles south of Pie Town to cut a dozen piñon trees for the Capital Hill Christmas Tree Project.

RS “Buck” Buchanan and his wife Pat have owned this ranch since the 1970’s. They have been Tree Farmers since the early 1980’s and were selected **New Mexico Tree Farmer**

of the year in 2000.



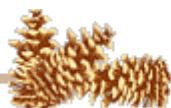
*Mike Kinney and Doug Boykin select a tree for harvesting.*

The Buchanan’s along with ranch Forman Lester Reid have been “managing the piñon/juniper stands found on the ranch. It was one of these “managed stands that Boykin, Harrington and Kinney traveled to, to harvest the trees.



*Dr. Harrington shows that he is good with a scalpel (chainsaw) and surgical garb (chaps, hardhat and gloves).*

The dozen or so Christmas trees were all piñons less than 12 feet tall. The area in which the trees were growing used to be a





dense old growth stand with very limited understory cover. In many areas of the stand grass and forb cover was less than 10 %. Starting in the late 70” and continuing until the late 80’s this area was extensively cut to improve forage production for both livestock and wildlife.



*Several Piñon getting ready for the trip to the nation’s capitol.*

Fuelwood was removed where possible, and small slash was left to “melt” into the ground and provide micro sites for both natural and artificial seeding. As what happens with many areas such as this, once the “overstory” piñon/juniper is removed, the small suppressed piñon start growing with increased vigor. These ‘released” piñons where the ones that Boykin, Harrington and Kinney were in search of.

Due to the elevation (about 8,000 feet), the rich soils, and proximity to the Continental Divide, within 100 yards, these “released “trees have the optimal growing conditions and show it. Thick crowns, balanced height and width growth and limited damage from livestock, wildlife and the weather, make this location a Christmas tree lot, ready for the harvesting.

It took about a hour to find the six “perfect” trees, ranging in height from 6 to 12 feet, cut them and load them on the flat bed for the ride back to Socorro, the first step in their cross-country trip to the nation’s capital.

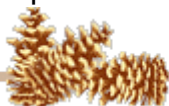


*New Mexico Representative Heather Wilson poses with a Buchanan Piñon at her Washington, D.C. office.*

The New Mexico Tree Farm Committee greatly appreciates landowners/ Tree Farmers such as the Buchanan’s and their dedication to forestry.

**Philmont Scout Ranch Demonstration  
Forest Sends Christmas Tree to  
Washington  
Harry Morrison – Consulting Forester &  
Chair of the New Mexico Tree Farm  
Program**

During the summer the one mile loop trail through the Philmont/Tree Farm Demonstration Forest has a steady stream of scout troops passing through. During the June to August





camping season approximately 5,000 scouts and their adult advisors back pack through the 40 acre demo forest on their way to a back country camp . Many campers stop to read the signs at the ten learning stations scattered along the trail. The signs explain the soil, water, wildlife, and plants of the forest and the benefits derived from the harvests of wood products.

The November day that we cut the two companion trees that went to Washington D.C. for the holidays was quiet. The scouts were long gone and no one else was around on several thousand acres of rugged pine and spruce/fir forests. The solitude allowed us plenty of time to look for trees. The demonstration forest contains a mixture of ponderosa pine white fir, Douglas-fir, and small amounts of aspen and southwestern white pine. White fir and Douglas-fir are two species that make nice wild Christmas trees so we looked for the "perfect specimen". Needless to say nature doesn't "make" a perfect tree. Wild trees can be cultured to grow a better Christmas tree but this hasn't been done on the Philmont so we were looking for nature's handiwork. After several hours of pleasant looking at scores of trees from all angles we settled on two to grace the halls of Washington D.C. a twelve foot and a sixteen foot tree, both White firs.

The demo forest has very good regeneration and could produce many more Christmas trees in the future particularly with a little help from culturing.

### **A Tough Decision**

***Darrell Pehr – New Mexico State University  
December 8, 2006***

Mora County – The conversation among forestry professionals in a remote, high-country woodland recently sounded more like the family chatter at a neighborhood tree lot during the weeks before Christmas.

“That’s really nice. That’s the fullness

were looking for.”

“This is a tough decision.”

“That is a gorgeous tree.”

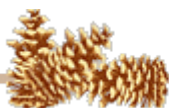
But the experts from New Mexico State University and the U.S. Forest Service were choosing trees from Bartley family ranch to grace the dining rooms and offices in Washington D.C., rather than the living rooms and dens in Albuquerque.



*The Christmas Tree Harvesting Crew including the Santa Fe National Forest Hot Shots, Editha and John Bartley, Thomas Quintana, Ruben Montes and John Harrington.*

By lunchtime, the crew had gathered six stately trees to be used in the Senate private dining hall, the U.S. Department of Agriculture building, the office of Forest Service Chief Dale Bosworth and other locations in the capitol city.

**Tree Farmers** from across the state participated in the 2005 Capitol Christmas Tree project, which required more than 60 “companion” trees to accompany the “People’s Tree,” an 80-foot Englemann spruce selected from the Santa Fe National Forest near Cuba, NM. The spruce is now displayed on the west lawn of the U.S. Capitol, fully decorated after a special lighting ceremony Dec. 8.







*New Mexico Tree Farmer John Bartley puts the final touch on Christmas tree for the Chief of the Forest Service's office.*

"Folks are really eager to participate," said Reuben Montes, a rural community assistance coordinator for the Forest Service's Collaborative Forest Restoration Program. Montes helped secure companion trees to meet each request from Washington. New Mexico's senators, for example asked for piñon trees, which were harvested from a **tree farm** near Pie Town.

NMSU professor John Harrington, who supervises the university's Mora Research Center and is chair of the Southwestern Section of the Society of American Foresters, works with **tree farmers** statewide. Donors he works with are member of the **New Mexico Tree Farm Program**. Additional companion trees were solicited from New Mexico Christmas tree retailers.

The companion tree project follows the thinking behind forest management plans Harrington helps prepare for cooperating landowners: Thinning the forest can reduce fire danger, improve forest health and generate income for entrepreneurs who sell Christmas trees. New Mexico Christmas trees bring in about \$1.1 million each holiday season, according to an NMSU study.

Harrington said the conversation on the ranch was a good illustration of the current Christmas tree market.

"Not everyone's vision of the perfect tree

is the same," he said. Some people prefer sheared, shaped, plantation-grown trees while others choose more natural, wild trees that show the character of New Mexico Forests.

Each of the companion trees is now displayed in Washington with a placard that tells which **tree farm** harvested the tree. For rancher John Bartley, the donation is well worth the publicity and education he hopes will take place when people see the trees from New Mexico.

"Everybody thinks we're a desert," he said.

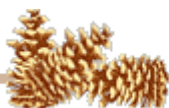


*John Harrington and Santa Fe Hotshot members bundle a white fir for transport to Washington D.C.*

The Bartleys harvest about 600 (Christmas) trees a year from their 4,000 acre ranch, so a lot of New Mexicans already are familiar with their trees, which are sold at lots in Albuquerque, Clovis and Carlsbad. Perhaps their most popular annual project is supplying more than 100 7- to 10-foot trees that are used to build one huge tree at Old Town in Albuquerque.

"These are trees that don't have to be perfect," said Editha Bartley, John's mother. "It makes one, giant, full Christmas tree." The project is a chance to thin some of the ranch's misshapen trees. "The reject trees should be trimmed as well as beautiful trees," she said. "It's like weeding the garden."

John Bartley feels a sense of





satisfaction as the trailers are loaded and the six trees are marked with their destinations.

“To me, it’s an awesome feeling,” he said. “This is really neat, to give something to the nation.”

### **New Mexico Tree Farmer Gets That Presidential Feeling**

***John Harrington – New Mexico State University – Mora Research Center***

The largest Christmas tree requested as part of the Companion Tree Program was the tree destined for the rotunda of the Supreme Court Building. Ruben Montes of the Santa Fe National Forest and myself had the dubious honor of trying to find this special Christmas tree. For several months we tried to explain to the Capitol Architect, the person in charge of setting the specifications for this tree, that New Mexico Christmas tree producers and Tree Farmers do not grow large sheared/shaped Christmas trees. Rather they select trees from their forest lands which have inherently good form and characteristics. In the end, a total of seven candidate trees were selected from quite literally thousands of potential trees. At this point I wish to thank the Rivera, Mundy, and Bartley Tree Farms and the Philmont Scout Ranch for their hospitality and willingness to submit candidate trees for the Supreme Court. Also, a big thanks needs to go out to New Mexico Tree Farm Program Chairman, Harry Morrison, State Forestry Staff Arnie Friedt, Joe Carrillo and Craig Daugherty who took so many wonderful pictures that were ultimately used to make the final decision regarding the Christmas tree in the Supreme Court Rotunda.

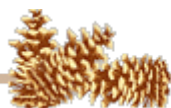
Most of these communications with the Capitol architect began in late August and continued through mid-November when the final decision was made. (Here is a little foreshadowing in this saga – recall what was going on in Washington D.C. regarding the Supreme Court at this point in time.) Digital pictures were sent, requests were made for

more candidates and more photographs were taken and sent again. Speaking for myself, and probably Ruben, all seven candidate trees whose photographs were sent were nothing short of beautiful. By early November it appeared a 35 – 40 foot Douglas-fir growing on the Bartley Tree Farm had been tentatively selected by the Capitol Architect. I say tentatively because the Architect also stated in his message he would also be looking for a tree closer to Washington D.C. that could be used.



*John Bartley, Editha Bartley, John Harrington and a Christmas tree named Harriet Maiers.*

As the November 17 date of harvest was finally decided upon, I and John Bartley as well as his mother Editha, began preparing to harvest the tree. Harvesting such a large tree takes a lot of planning and coordination. John Bartley cleared out an area to fell the tree and get equipment in to load the tree on a large truck. John and I coordinated with a local logger Mr. Pat Sanchez of Mora and the Mora-San Miguel Electric Cooperative to assist in the process. (A side note here – a real challenge





to harvest a Christmas tree of this size is being able to fell the tree and load it on a trailer with minimal damage to the tree. Mr. Sanchez and the San Miguel-Mora Electric Cooperative were going to use their log trucks and cranes to allow this effort to proceed.) We also had contacted the local press and finally the Santa Fe National Forest Hot Shot Fire Crew was also scheduled to assist. Everything was set to have a tree from a New Mexico Tree Farm be the focal point of the holiday season at the Supreme Court.

Well at 6:30 on the evening of November 16<sup>th</sup>, Ruben Montes called me at home. He asked if I was sitting down. He had just received a correspondence from the Capitol Architect stating that they had decided to go with a plantation grown tree from a Pennsylvania Christmas tree grower instead of one from New Mexico. Needless to say I was disappointed but had to make several phone calls to call off some of the activities scheduled for the next day. My first call was to the Bartley's. I let John know of the decision, who I must say took the news better than I. Then I asked him if he was feeling presidential. He asked me what I was referring to. Well, I said much like the President's nomination for the Supreme Court, Harriet Meyers, John's nomination had been turned down. He laughed. I then called Mr. Sanchez and the folks at the San Miguel Electric Cooperative and broke the news to them and thanked them for all their help.

The next morning Ruben, the Santa Fe Hot Shots, a reporter from New Mexico State University and I went to Bartley's to harvest some of the other companion trees which the Bartley Tree Farm had donated. Our first stop was to visit the now infamous tree called Harriet Meyers. The rest of the morning was spent harvesting the last of the companion trees from New Mexico destined for Washington. The pride shown by John and his mother Editha, the Santa Fe Hot Shots, Ruben

and John's staff reminded me how fortunate I am to work with such fantastic folks who share my passion for forestry and forests.

## **Arboriculture, Part 2**

***By Joseph Stehling***

This is the second in a series of articles on trees, their structure and care. In the first article I focused on 10 principles associated with tree care. In this article I will focus on plant structure and function.

The sources for this article are:

### **Arboriculture. Integrated Management of Landscape Trees, Shrubs, and Vines.**

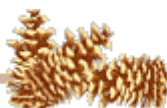
Richard W. Harris, James R. Clark, and Nelda P Matheny, Fourth Edition, Prentice Hall, 2003. And

**Perone's Tree Maintenance.** Hartman, Perone, and Sall, Seventh Edition, Oxford Press, April 2000

It is important to understand the structure and function of the tree and the interaction between the two. Woody landscape plants vary greatly in size and form; they are all vascular plants (have conduction tissues) similar in structure and internal functioning. Although the information on tree growth and development and the influence of environmental factors are described in general, there is a great species-to-species variation.

Trees are perennial, long-lived, and massive. As such trees depend on the capacity to add new tissue without reducing structural stability, to respond to wounds, to discard nonfunctional parts, and to adapt to the environmental change that is inevitable over time. Understanding the nature of these features is required for proper tree care.

From a mechanical standpoint, trees are





self-optimizing structures; that is they actively add wood in response to mechanical stress. Growth occurs to evenly distribute mechanical stress, which occurs in the form of weight or wind, throughout the structure. If a tree is leaning, new xylem is formed that tends to straighten the tree.

As you will no doubt recall from your Master Gardener training, xylem transports sugars and carbohydrates upward from the roots to every element of the tree. Phloem transports the carbohydrates manufactured by photosynthesis downward from the leaves to the roots of the tree.

Annual shoot elongation is a good measure of plant vigor. Watersprouts and suckers indicate that a plant is in vigorous condition, at least that part of the plant below the vigorous growth. Watersprouts are vigorous shoots that grow from aboveground or above the graft union. Suckers are shoots that grow below the graft union. Watersprouts are often forced into growth just below large pruning wounds, particularly when branches have been cut to stubs. Watersprouts are also stimulated to grow by sudden exposure to light, such as when a stand is thinned or a tree is severely pruned. Watersprouts are seldom firmly attached to the trunk or branch from which they arise. Only the new layers of bark (phloem) and of wood (xylem) formed since the sprout started growth unite it with the tree. Consequently, they can break off relatively easily for a number of years. Both suckers and watersprouts should be removed as early as possible. On occasion a watersprout may be allowed to grow and develop into a main branch to fill a void in the plant. Suckers however, are usually a different genotype than the grafted top.

The aboveground parts of a plant depend on roots for anchorage, absorption of water and mineral nutrients, storage of food reserves, and synthesis of certain organic materials, including those that may regulate activities in the top to the plant. The development, size, form, and function of root

systems are controlled by the genetic makeup of a plant and by environmental and management conditions that modify the expression of these characteristics.

Roots, other than the taproot, may enlarge as they grow downward giving stability to the top of the tree. These are called heart roots. Some trees have primarily horizontal roots near the surface and sinker or striker roots that grow vertically from the horizontal ones. Sinker roots usually occur near the tree trunk, adding stability to the tree and increasing the volume of deeper soil exploited by the roots. In most mature trees, the taproot is outgrown by the heart and lateral roots and is difficult to find. Root systems are much closer to the surface than is commonly thought. The most critical root zone encompasses the main root plate, the area adjacent to the base of the tree containing the largest roots

Root growth is opportunistic; that is, roots proliferate in areas conducive to growth. In fertile soils in the absence of competition, individual roots may extend in a more or less symmetrical manner. Roots of most plants, including large trees, grow primarily in the top three feet of soil. . Roots can extend to twice the diameter of the tree crown. Any variation from his ideal condition because of competition from other plants or variations in soil will result in asymmetric growth.

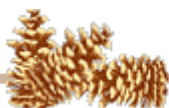
In the next article, I will discuss various types of damage and the effects the damage has on the tree.

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## **New Mexico Tree Farm Executive Committee**

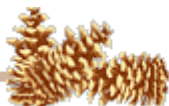
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*New Mexico Tree Farm News* is published once or twice a year, depending on funds. Distribution includes over 150 Tree Farmers throughout New Mexico along with over 50 forest product producers. If you would like to advertise your Tree Farm, your products, or your company, please send us the information and we will be glad to include it in the next newsletter.

Donations to cover printing and mailing cost are always appreciated.

*Dear New Mexico Tree Farmers:*  
*I want to again encourage all New Mexico Tree Farmers who wish to submit their writing to do so. Also, as you have read in the past two issues, if you come across an article you think others might like, please send a copy to me with information on how to contact the author or publisher for permission to reprint the article. The easiest way is to submit your article, poem, etc. via electronic mail to John Harrington (joharrin@nmsu.edu) or by regular mail at:*

*John Harrington  
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- John Harrington, Editor  
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## 2005 New Mexico Tree Farm Committee Christmas Tree Ornament

As many of you all know, we have several NM Tree Farmers who are donating native grown trees off their private lands to be placed in various federal offices in Washington DC, as well as in Sen. Domenici's, Sen. Bingaman's, Rep. Wilson's and Rep. Pearce's offices.

The Tree Farm Committee wanted to make sure that these offices realize where the trees came from, as well as the Tree Farmers themselves receive something for their efforts. So we are getting Christmas Tree Ornaments made.



We have ordered 100 of these ornaments, and expect to give out about 15, leaving 85 or so to sell to interested members, State Forestry employees, etc. We should have them right after Thanksgiving, in time for the division meeting.

Cost will be \$15.00 each. Please fax in the needed information if you want one reserved for you and your family.

Name \_\_\_\_\_

Number of Ornaments \_\_\_\_\_

(Checks can be made out to the New Mexico Tree Farm Committee)  
Fax to NM State Forestry, Socorro  
(505.835.9452)

