

# FLORIDA LAND STEWARD



A Quarterly Newsletter for Florida Landowners and Resource Professionals

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## Mysteries of the Bark and Ambrosia Beetles: Introduction to the new Forest Entomology lab at University of Florida

By Jiri Hulcr, Forest Entomologist, UF/IFAS School of Forest Resources and Conservation

If you have any connection to forests in Florida, you have probably heard the term "bark beetle" or "ambrosia beetle". You have probably heard it in connection with some bad news such as tree deaths, destruction of forests, or invasive species. Indeed, the group of bark and ambrosia beetles includes some of the most destructive pests of forests, nurseries and fruit trees. But there is more to them than damage – these insects live intriguing lifestyles, and resemble human societies in several ways, including collaboration with each other and the practice of agriculture. The new Forest Entomology lab at the University of Florida studies wood boring pests from all these angles.

The whole group of bark beetles and ambrosia beetles is called the



Jiri Hulcr, Forest Entomologist, UF/IFAS School of Forest Resources and Conservation

scolytine beetles, from the term Scolytinae, the taxonomic name of the whole group. Believe it or not, scolytines are a subgroup of weevils, the long-nosed beetles. About 100,000 years ago, a small group of prehistoric weevils evolved a shorter nose

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The Western bark beetle *Dendroctonus brevicornis* failed in an attempt to colonize a healthy tree; the tree killed it and flushed it out in resin.

and the ability to live safely inside tree tissues. This innovation allowed the group to become incredibly successful, with over 6,000 species of scolytine beetles now inhabiting forests across the entire globe.

**If scolytines are all descendants of a single group of weevils, why are some called bark beetles and some ambrosia beetles?** It is a distinction based on what each species eats. Bark beetles, such as the pine engraver beetles, live in bark and eat the tissue of the dead tree, specifically the phloem, where sugar was transported. Ambrosia beetles, on the other hand, create tunnels deep into the xylem of trees, where water is transported. Unlike bark beetles, they don't eat the tree tissue. Instead, they move the sawdust out as refuse (sometimes this looks like sawdust "noodles" on the tree surface), and plant gardens of fungi. It is these symbiotic fungi, the so called ambrosia fungi, which serve as an "extended stomach" for the beetle, growing throughout the wood, and delivering nutrients to the beetle progeny. This is one of the most sophisticated and successful examples of animal-fungus symbioses in the world, and it is all around us, in everyone's backyard, right now. You can learn more about the symbiosis on our lab's website at [www.ambrosiasymbiosis.org](http://www.ambrosiasymbiosis.org).

**Why are the scolytine beetles such successful pests?** This is due, at least in part, to their unique ability to collaborate. Unlike most other wood boring insects, scolytine beetles engage in sophisticated collaborations. There are two major collaborations: (1) with other scolytines to kill the tree they are using, and (2) collaboration with fungi on extracting nutrients from the tree.

Killing a tree is a process called mass attack, a highly coordinated effort of many, often hundreds, of individuals.

The beetles produce volatile chemicals, called pheromones, which communicate with the rest of the population that this tree is a good place to be. An example of this collaboration is an outbreak of Southern Pine Beetle, in which a population of the beetles can overcome a pine tree in a matter of days. Most other wood boring insects, such as the long horned beetles (Cerambycidae) or the flat headed borers (Buprestidae) live solitary lifestyles, and are not able to kill trees in a collaborative fashion.

The second type of collaboration that scolytines engage in – that with fungi – has allowed these beetles to extract much more nutrients from the wood than the beetle could on its own, in much shorter time.

**But wait – ambrosia beetles are said to be vectors of tree pathogens!** Yes and no. It turns out that the readiness of beetles to work together with fungi has brought them another unexpected advantage. Sometimes the fungi that beetles carry around act not only as food for the beetle, but also as a pathogen of the tree host.

This really only happens in situations where the beetle-fungus pair is introduced to an area where the local trees are not adapted to that particular fungus. The current laurel wilt disease is an example. The redbay ambrosia beetle, originally from Asia, carries a fungus that is well adapted to growing in dead redbay relatives in Asia. However, the redbays and avocados in the U.S., until now, had not been exposed to such a fungus that is capable of living in their tissues. As a result, the trees developed a massive immune reaction that is so over-the-top that the trees are essentially killing themselves. This is of course great for the beetles – their fungi are not only providing them food as they always have in their native region, but now also dead trees in the newly invaded region! Thus we have ended up with a massive outbreak of the redbay ambrosia beetle all across the Southeastern U.S.

**The good news is that, under normal circumstances, beetles actually kill trees very rarely.** The natural habitat of the large



External signs of ambrosia beetle infestation: sawdust noodles.



majority of bark and ambrosia beetles are freshly dead trees, not live trees. Ninety nine percent of trees that suddenly die, and that contain beetle colonies, have not actually been killed by these beetles. The beetles entered after the tree died. In my extension work, I provide advice



Tunnels of the Southern Pine beetle *Dendroctonus frontalis* in the phloem of a dead pine. The larvae live in tunnels that branch off of the main tunnel created by the mother.

to landowners and forest managers across the state. This allows me to see many cases of tree deaths, and witness the tendency to blame those deaths on the only suspects that are actually visible – the thriving beetle populations under bark. However, in virtually all cases, there is a pre-existing condition, be it drought, a fungus root infection, a mechanical injury, or other causes that had stressed the tree. The beetles are only responding to the stress, and are attracted to an already weakened and defenseless tree.

**The notorious troublemakers, such as the Southern Pine Beetle, are actually very rare in the forest most of the time.** The famous outbreaks of monstrous proportions only happen when the stands are mismanaged, not sufficiently thinned, too old, too dry or too wet, in other words, when there is a sufficient amount of stressed individual trees. That's when the beetles gain the upper hand, their population explodes,

and they start attacking healthy trees as well. Bark beetle outbreaks are a function of the forest health, rather than of beetle aggression. In healthy, reasonably spaced, unevenly aged and mixed forests, the Southern Pine Beetle is actually a rare insect, often difficult to find. This is one of the big mysteries of Forest Entomology – where are these pests when they are not in outbreak? In natural or well-managed stands, it is very difficult to find these fearsome pests, and it is not quite known how their populations survive the decades between outbreaks.

If you have more questions about forest pests, whether ones you deal with, or in general, and not limited to bark beetles, please get in touch with me, Jiri Hulcr, (352) 273-0299, [hulcr@ufl.edu](mailto:hulcr@ufl.edu), <http://www.ambrosiasymbiosis.org>

## Funds Available for Florida Landowners Interested in Longleaf Pine

Landowners in Florida who want to establish or improve longleaf pine on their properties can take advantage of cost-share funds offered through the USDA Natural Resources Conservation Service (NRCS). In addition to the potential cost-share funds, landowners will receive a wildlife management plan and maps for their property.

Longleaf pine forests are the South's most unique ecosystem. These forests provide an important and diverse habitat that is home to 26 federally listed endangered species such as the indigo snake, red-cockaded woodpecker and gopher tortoise. They also provide outstanding habitat for white-tailed deer and wild turkeys, along with many non-game species.

Cost-share programs such as this are vital to restoring the longleaf pine to its former grandeur and to helping landowners maintain their lands as working forests. Working forests provide clean water, wildlife habitat and recreational opportunities that benefit landowners, wildlife, hunters and anyone who enjoys the outdoors. This longleaf restoration and management opportunity is available thanks to a cooperative agreement between the Natural Resources Conservation Service and National Wild Turkey Federation (NWTF). Landowners do not have to be NWTF members to participate.

Landowners in Florida who are interested in this cost-share opportunity should contact NWTF

Regional Biologists Derek Alkire at (352) 262-2373 or [dalkire@nwtf.net](mailto:dalkire@nwtf.net) or Ricky Lackey at (229) 378-0003 or [rlackey@nwtf.net](mailto:rlackey@nwtf.net) for more information.



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## Benjamin “Guign” and Judi Wyche Named Florida’s Outstanding Tree Farmers for 2012

By Dave Norton, Florida Tree Farm Committee

Madison County now has something new to brag about; Benjamin (Guign) and Judi Wyche, local tree farmers, have received the prestigious award of being named Florida’s 2012 Outstanding Tree Farmers. Their 330 acre tree farm, Rollercoaster Hill, has been in the Wyche family for three generations. Over time, the Wyches have established some of the finest planted longleaf pine stands in north Florida.

Achieving this award isn’t a piece of cake. The nomination is just the first step in a rigorous process of determining the best tree farm over the entire state of Florida. To be considered for this award, besides demonstrating sound forest management, a landowner must show all 10 standards of sustainable, multiple-use forestry, evidenced by their practices, which also benefit water quality, wildlife habitat, aesthetics and recreation.

As he presented the plaque to the Wyches prior to their November tour, outgoing Florida Tree Farm Committee Chairman, Shawn Cook of St. Joe Timberland Company, spoke of the Wyches’ endeavors. “Benjamin and Judi Wyche are outstanding examples of families that find many benefits from owning and managing forests,” said Cook. “We can all learn from their example of being good land stewards with core values of hard work, community responsibility and commitment to protecting Florida’s forest legacy”. Now the Wyches are eligible to compete for the southeastern region and if chosen, will go on to compete for the Outstanding National Tree Farmer.

Two other awards were handed out at the ceremony on Rollercoaster Hill. Greg Marshall, Levy County Forester with the Florida Forest Service, was named 2012 Florida Tree Farm Inspector of the Year. Shawn Cook

was also honored with an award for his outstanding service to the Florida Tree Farm program.

The American Tree Farm System is a nationwide community of more than 96,000 individuals and families joined by their desire for excellence in forest stewardship. These land-owners manage their land to meet the highest standard of sustainability and strive to be good stewards for the future. Founded in 1941, ATFS has 26 million certified acres of privately owned forest land, whose owners are committed to excellence in forest stewardship. In Florida there are over 1,000 certified Tree Farms. You can learn more about the Tree Farm program in Florida online at [www.floridaforest.org](http://www.floridaforest.org) or calling the Florida Forestry Association at (850) 222-5646.

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## Plants Behaving Badly: Chinese tallow-tree

By Alicia Campanella and Chris Demers

Chinese tallow-tree (*Sapium sebiferum*), native to Eastern Asia, was introduced in the U.S. in the 1800’s. Like most exotic introductions, this plant was thought to be beautiful, useful, and economically beneficial; especially because of its seeds and oils. The seeds are rich in fatty acids and amino acids, and when processed, yield a flour rich in B vitamins. The kernels are rich in iodine, and the oil is used as a drying and preserving agent. Adding to this list of useful traits are several documented uses in Chinese medicine and the tree’s attractive foliage, so it is easy to see why the tree was so appealing.

### An Aggressive Invader

Recognition of this plant as an aggressive invader did not occur in time to prevent it from becoming a problem, replacing thousands of acres of native habitat, leaving thick, biologically impoverished monocultures in its wake. Today, it is found in every region of Florida, excluding the southernmost tip of the state. Its rapid growth rate allows it to turn vast areas of prairie into tallow forests in less than a decade once it has been established. It can thrive in a wide range of conditions from wet to moderately dry, and can even tolerate salt water environments. It is recognizable by milky sap, small yellow



flowers, heart-shaped leaves that turn bright yellow in the fall, and a profusion of white, popcorn-shaped, waxy fruit. Seeds are plentiful and dispersed by water, birds and other animals.

### Control

Since reaching Category 1 status on the invasive exotic species list in 1991, efforts have increased to control Chinese tallow's spread throughout the state. This has been especially difficult where the tree is used for horticultural purposes. It can be difficult to convince homeowners that the beautiful fruiting trees they had grown to love are a

menace. It's not hard to convince land stewards and managers of the problem and control and restoration efforts are well underway on many public and private lands.

As with any exotic species, prevention is the key. Remove any seedlings before they mature enough to produce seeds. Foliar application of 20% triclopyr mixed with an oil based diluent is most useful in autumn, before the tree releases its seed crop. If you are able to mechanically cut down the tree, spray the cut stump with the same. If not, simply spray a complete

ring around the tree (this is called the basal bark method) that should begin approximately twenty inches from the ground, and extend down to the root collar. Be watchful of any new seedlings thereafter. Remember to always follow manufacturers' safety labels and wear personal protective equipment when using herbicides.

For more information about this plant, other invasive exotic species, funding, and regional efforts to prevent and control infestations see the Florida Invasive Species Partnership web site at <http://www.floridainvasives.org/>

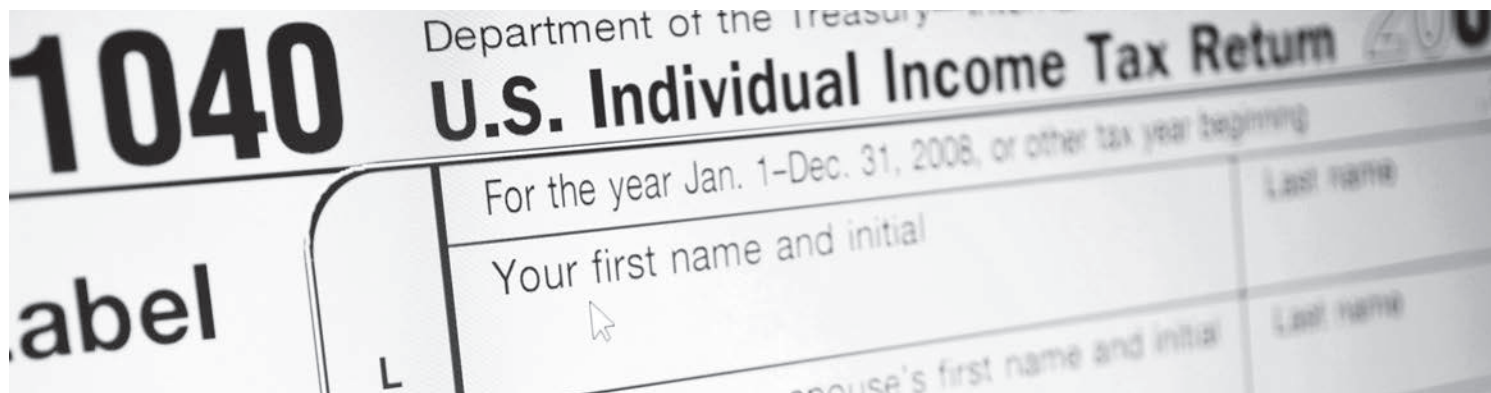
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## Tax Tips for Forest Landowners for the 2012 Tax Year Available Online

Each year the USDA Forest Service produces a bulletin to assist forest landowners and their advisors with timber tax information they can use

to file their income tax returns. The bulletin for the 2012 tax year is available at: <http://www.fs.fed.us/spf/coop/library/taxtips2012.pdf>

Those without web access can contact Chris Demers, (352) 846-2375, [cdemers@ufl.edu](mailto:cdemers@ufl.edu) and request a copy.



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## Get Email Updates!

Don't miss out on upcoming events and news! Send an email to [cdemers@ufl.edu](mailto:cdemers@ufl.edu) to be added to the Stewardship listserv. Updates are sent weekly.

# TIMBER PRICE UPDATE

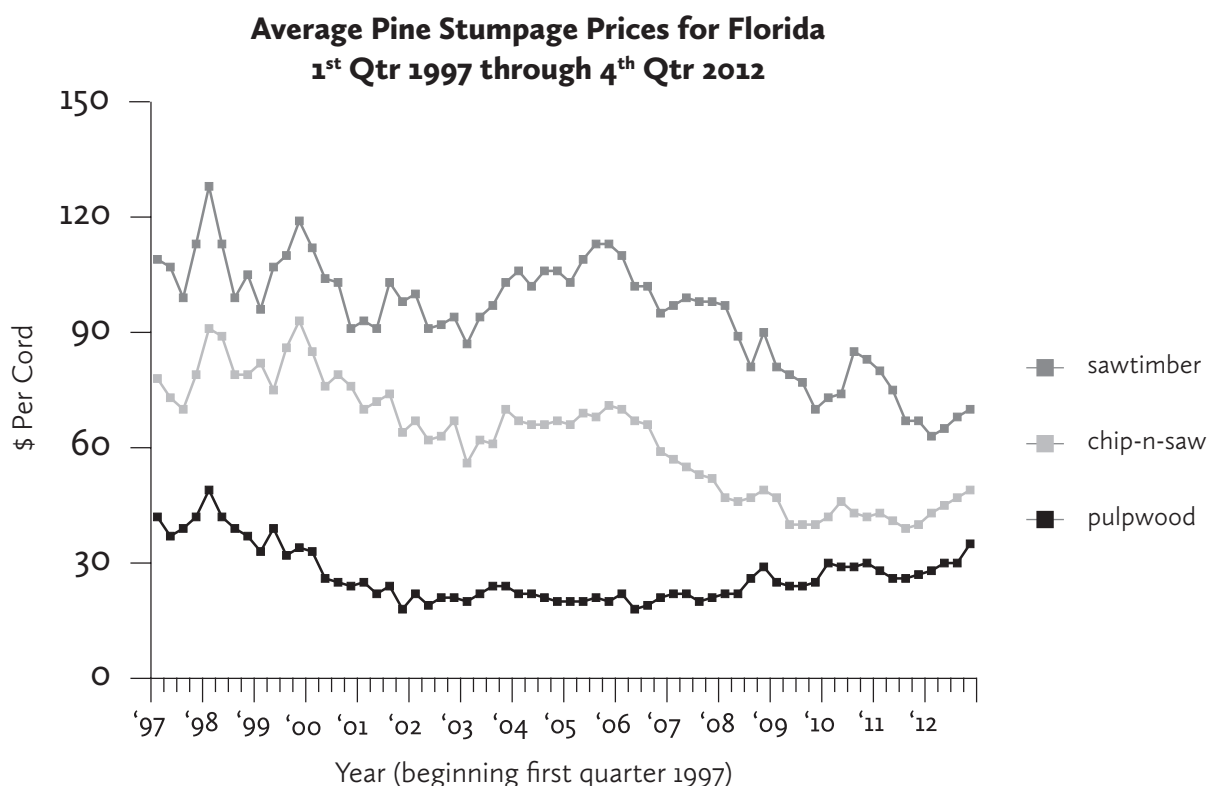
The timber pricing information below is useful for observing trends over time, but does not reflect current conditions at a particular location. Landowners considering a timber sale are advised to solicit the services of a consulting forester to obtain current local market conditions.

Average stumpage prices for the three major products in Florida, as reported in the **4<sup>th</sup> Quarter 2012** Timber Mart-South report were:

Florida Stumpage Prices	
<b>Pine pulpwood:</b>	\$35/cord (\$13/ton), ↑ slightly from 3 <sup>rd</sup> Qtr 2012
<b>Pine C-N-S:</b>	\$49/cord (\$18/ton), ↑
<b>Pine sawtimber:</b>	\$70/cord (\$26/ton), ↑

## Trend Report

Average prices for most timber products continue to improve modestly in Florida and across the South. Housing markets have improved slightly with some increased investment in residential construction. While pulpwood prices, on average, seem to be on the rise in FL, paper and paperboard production was slightly lower this quarter than the same time a year ago. Global political and economic distresses continue to loom and encourage cautious investments.



Timber Mart-South is compiled and produced at the Center for Forest Business, Warnell School of Forest Resources, University of Georgia, under contract with the Frank W. Norris Foundation, a non-profit corporation serving the forest products industry. See <http://www.tmart-south.com/> for information on subscriptions.



# CONGRATULATIONS

## CERTIFIED FOREST STEWARDS AND TREE FARMERS

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For more information about becoming a Certified Forest Steward or Tree Farmer, call your County Forester or learn about it at:

[http://www.fl-dof.com/forest\\_management/cfa\\_steward\\_index.html](http://www.fl-dof.com/forest_management/cfa_steward_index.html)

or

[http://www.floridaforest.org/tree\\_farm.php](http://www.floridaforest.org/tree_farm.php)

These landowners have a current Forest Stewardship and/or Tree Farm management plan for their property and have demonstrated excellent stewardship of their land resources.



Alan and Linda Weiland, Washington County



Vivian Griggs, with Greg Barton (L) and fellow Forest Stewards, John Rudniansyn and Richard McGinley, Marion County



Benjamin "Guign" and Judi Wyche, Florida 2012 Tree Farmers of the Year, Madison County

### Upcoming Stewardship, Small Farm and Other Events

Date	Event, Location, Contact
Feb. 14	<b>Forest Stewardship Tour at Osceola Pines</b> , Property of John and Allison Nash, Levy County, 9 am to 2 pm ET. \$10 fee. <i>Contact Chris Demers at (352) 846-2375 or <a href="mailto:cdemers@ufl.edu">cdemers@ufl.edu</a> for info or to sign up.</i>
Feb. 20	<b>Deciduous Tree ID in Winter – Indoor Lab</b> , 9 am to 12:30 pm, UF/IFAS Extension Leon County, Tallahassee, FL. \$20 for professionals (materials and CEUs + 6 hours of training); one fee covers pair of events. <i>Please register for the lab and hike (and CEUs) online at <a href="http://leonextension2013treeidwinter.eventbrite.com">http://leonextension2013treeidwinter.eventbrite.com</a> or call Genice Harris at (850) 606-5202.</i>
Feb. 21	<b>2013 Florida Berry Expo</b> , UF/IFAS Gulf Coast REC, 11:30 am to 4 pm. <i>Details and registration at <a href="http://2013floridaberryexpo.eventbrite.com/">http://2013floridaberryexpo.eventbrite.com/</a></i>
Feb. 27	<b>2013 Heartland CISMA Invasives Workshop</b> , 9 am to 4 pm, Circle B Bar Reserve, 4399 Winter Lake Road, Lakeland, FL 33803. <i>Register at <a href="http://cismaworkshop.eventbrite.com/">http://cismaworkshop.eventbrite.com/</a> or call Debi Tharp, (407) 935-0002 x.128, or Shannon McGee at (863) 519-8677 x. 102.</i>
Mar. 1	<b>Deciduous Tree ID in Winter – Field Lab</b> , 1 to 5 pm, Elinor Klapp-Phipps Park, Tallahassee, FL. \$20 for professionals (materials and CEUs + 6 hours of training), \$10 for other citizens; one fee covers pair of events. <i>Please register for the lab and hike (and CEUs) on-line at <a href="http://leonextension2013treeidwinter.eventbrite.com">http://leonextension2013treeidwinter.eventbrite.com</a> or call Genice Harris at (850) 606-5202.</i>
Mar. 9	<b>Wildlife Food Plot Field Day</b> , 9 am to 4 pm, UF/IFAS North Florida Research & Education Center, 155 Research Rd, Quincy, FL. \$10 fee, pre-registration required by noon Friday March 8. <i>Pre-register online at <a href="http://nfredfoodplot.eventbrite.com/">http://nfredfoodplot.eventbrite.com/</a> or by phone, (850) 875-7100.</i>
Mar. 12	<b>2<sup>nd</sup> Vegetable and Small Fruit Protected Ag Field Day</b> , UF/IFAS Gulf Coast Research and Education Center. Free. <i>Details and registration at <a href="http://protectedagfieldday-es2001.eventbrite.com/">http://protectedagfieldday-es2001.eventbrite.com/</a></i>
Mar. 22	<b>Forest Stewardship Hike Tour at Whippoorwill Farms</b> , Property of David McPhaul, Gadsden County, 9 am to 2 pm ET. \$10 fee covers lunch and materials. About a mile long walk, some challenging terrain involved. <i>Register online at <a href="http://fsp-tour032213.eventbrite.com/">http://fsp-tour032213.eventbrite.com/</a> or call Gadsden County Extension at (850) 875-7255.</i>
May 8-10	<b>Florida Beef Cattle Shortcourse</b> , Straughn IFAS Extension Professional Development Center, Gainesville, FL. <i>Details and registration online at <a href="http://conference.ifas.ufl.edu/beef/index.htm">http://conference.ifas.ufl.edu/beef/index.htm</a></i>

### For many more events and information see: [floridalandsteward.org](http://floridalandsteward.org)

The Florida Land Steward Newsletter is a University of Florida Extension Service, Florida Forest Service, Florida Fish & Wildlife Conservation Commission, USDA Natural Resources Conservation Service and Florida Tree Farm joint project:

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