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ARBORIST NEWS

ISA

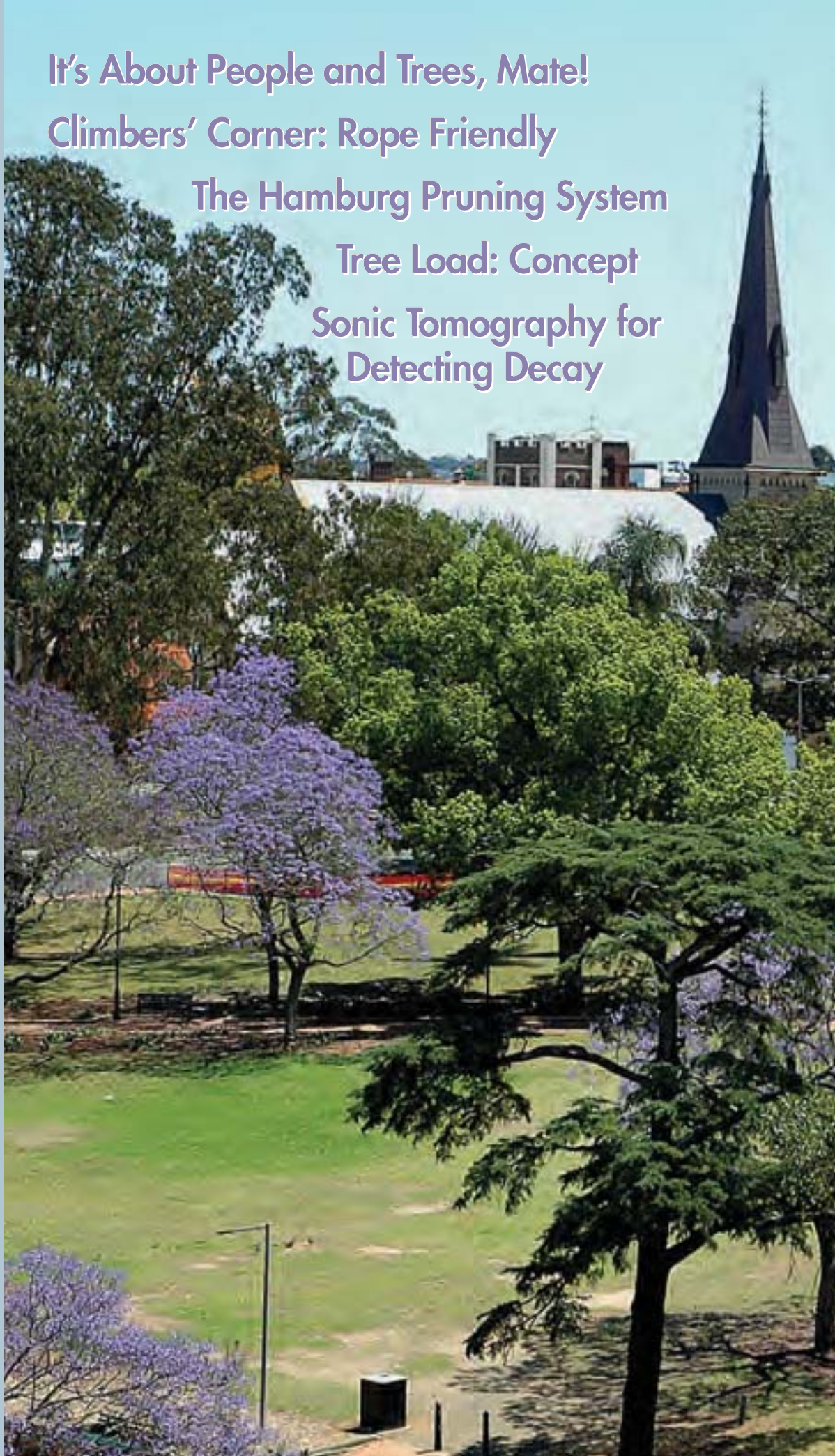
It's About People and Trees, Mate!

Climbers' Corner: Rope Friendly

The Hamburg Pruning System

Tree Load: Concept

Sonic Tomography for
Detecting Decay



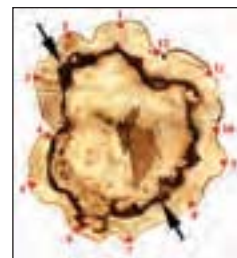
Tree Load: Concept

This month's CEU topic delves into the concept of tree loading. Learn about the different load categories and how they affect tree stability. **Page 12**



Sonic Tomography for Detecting Decay

Learn about the science behind the sonic tomography, a minimally invasive tool for assessing decay in trees. **Page 35**



ISA in 2010

Take a look at how ISA performed in 2010 and review the financial strength of the organization moving into the New Year. **Page 21**



It's About People and Trees, Mate!

Australia will host this year's Annual Conference & Trade Show. But also occurring at this time is the World Arbor Camp, an informal and family-friendly gathering for climbers, tree crews, and their families for games, workshops, and more. **Page 24**

The Hamburg Pruning System

Based on the results of a study conducted in Hamburg, Germany, this feature investigates pruning practices in relation to branch collars, codominant stems, and dead branches. **Page 28**



The Alex Shigo Park

Arborists and educators in Italy are laying the groundwork for an international center for disseminating knowledge about the environmental sciences. **Page 46**

Climbers' Corner: Rope Friendly

What makes an environment rope friendly? Mark Bridge has the answer. **Page 50**



An Interview with Russell Ball

Russell Ball, the current president of the ISA UK/I Chapter, talks about how he became involved in arboriculture, and where he feels arboriculture in the UK is currently going. **Page 58**

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DETECTIVE DENDRO™ THE DIAGNOSTIC SLEUTH

By Sean Freeman and Guy Meilleur



The Case of the Arrested Araucaria

Codit and I were boating back from our scuba dive into the Great Barrier Reef, where arborescent staghorn coral and dendriform sponges informed our continuing quest to comprehend tree architecture. Conifers covered the steep slopes facing the sea, so the coast of this island continent was sheathed with greenery. Codit focused his binoculars and observed,

“The predominant species with branches arching upward appear to be a species of *Araucaria*, related to the Norfolk and Canary Island pines. The bunya bunya tree (*Araucaria bidwillii*) has fruit so large it can be fatal when it falls, but the nuts are quite tasty. Since this is not in the genus *Pinus*, it is not a true pine, right?” Buildings were barely visible through small openings in the largely intact, deep-green forest. “These residential developments seem sensitive to the ecological and economic values of a continuous canopy,” my apprentice noted.

“Your identification seems accurate, and economic value is indeed enhanced by tree conservation,” I agreed. As we rounded a rocky point, I shielded my eyes from the glare of a larger opening in the canopy downslope of a residence. “Clearing large areas tends to destabilize adjacent trees, soil, and the rest of the landscape. Storm winds might be funneled up that opening toward the exposed home-site. That’s one more example of how tree removal can increase overall tree risk. The pattern of that opening indicates recent losses. The pale color and sparse condition of adjacent trees shows that a pathogen may be at play. Let’s investigate!”

Codit pulled out his phone. He tapped and slid his fingers across the screen. “It looks like the site is about 20 kilometers away, maybe 15 minutes to get there from the marina. The community is adjacent to a resort, where the caretaker is envied for having the best job on earth. Their restaurant features a tamarind-date-onion sauce on its pescatorian specialties...”

“Say no more,” I said. “Your visual and virtual investigations were excellent, and that map on your phone’s display pinpoints the problem area. Now we are armed for hands-on inspection.”

The transition from boat to car was smooth, and the views of the water, sky, islands, and trees along the coastline were stunning. As we pulled into the driveway I could see water over the roofline, but not to the sides. Codit knocked on the door and was greeted by the maid, who was so impressed by our arborist credentials that

she showed us the way around the house and down the slope. As we had seen from the boat, there was a break in the extended stand of native *Araucaria* between the rear of the residence and the shore line below.

Runoff from garden irrigation delivers supplementary water during drought, and the rocky soil provided very good drainage. The trees had minimal disturbance or competition from other plants and had self-mulched over time, all prerequisites for good health. From the house, the clearing provided vistas of the adjacent island and sea channel. We stopped at the largest ailing tree.

I set up my tripod and took a picture of an old pruning wound with several curious features. Loss of foliage was evenly distributed, a sign of severe and rapid canopy decline, mirrored by the freshly fallen needles on the ground. “Let’s see if we can figure out what’s going on here, Codit,” I challenged him as we gathered samples.

“Well, Dendro, there is a large patch of callus scarring over the right side of the pruning wound, but none is visible on the left,” he began, focusing in with his hand lens. “The sap leaking down the center of the wound is less sticky than normal sap, and it seems to darken over time. The white glob resembles fresh “pitch tubes” commonly seen where *Dendroctonus* sp. bark beetles infest pine trees. The hole adjacent to this pitch tube indicates penetration by a larger



Mysterious processes are at play around this pruning wound. Human, insect, fungal, bacterial, arboreal: which are causing the problem and what can be done about it?

insect, perhaps a longhorned, or 'longicorn' beetle, similar to ALB. The lack of scarring to the left indicates a disruption of circulation by the insect tunneling through the cambium. This tree is obviously a victim of insect attack, so we should recommend that the surviving trees get a preventive drench with insecticide, with precautions taken in regards to water quality of course."

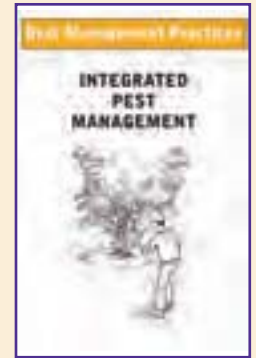
As I listened I looked around to the other side of the tree and snapped another picture. "Is this a pine? That depends on your point of view. Your observations, and some of your conclusions, are accurate. Check that wound a bit more closely and you will see evidence of other culprits, and at least two reasons for a standard pruning type to be done on this genus of tree. On the bark you will see the reason these trees could be associated with basketball. Let's look again at the tree and the site as we go to lunch. This case seems very complicated indeed."

Where did Codit's diagnosis go wrong? What clues did he miss, and what does any of this have to do with basketball? Turn to page 60 for the solution to this puzzling predicament.

Best Management Practices

INTEGRATED PEST MANAGEMENT

This guide features practices for designing, planning, and implementing an IPM program within a landscape as part of a comprehensive plant health care management system.



#P1320
Retail Price: \$10 • ISA Member Price: \$8
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JUST FOR FUN

Australian 201 G'Day!

So, you did well in "Australian 101" (December 2010), did ya now?
Good onya!

Now let's try matching some more challenging Australian terms and expressions with their U.S. English meanings. Then, try them out at the 2011 ISA Annual Conference & Trade Show in Sydney.



- ___ Aussie salute
- ___ Away with the pixies
- ___ Back of beyond
- ___ Big Smoke
- ___ Bingle
- ___ Footy
- ___ Gobsmacked
- ___ Grab a feed
- ___ Holy dooley!
- ___ Mate
- ___ Rellie or relo
- ___ Roo
- ___ Spit the dummy
- ___ Yabber

1. An exclamation of surprise
2. Get very upset
3. Get something to eat
4. Vehicle accident
5. Brushing away flies
6. Baby kangaroo
7. Family relative
8. Daydreaming
9. The state of being surprised
10. A large city, like Sydney
11. Far away from civilization
12. Buddy, friend
13. Talk (a lot)
14. Australian Rules football



Answers on page 64



WHAT'S THE SOLUTION?

Returning from lunch, we saw another car in the driveway. A stocky, red-faced gentleman lifted himself out and met us as we parked. "G'day mates! My property's closed for... um... renovations now; should take a month or two, no problems, you blokes try back later, ta for now!" he said in a rush, turning toward the house.

Codit started to respond, but I gave a wave and put the car in gear. "That's strange timing, and I didn't see any need for renovations. But I do feel a need for dessert." Codit wondered aloud as we drove back to the restaurant. I stayed quiet as we navigated the winding road. The didgeridoo on the radio wailed like a trumpet.

"No surprise in the timing, my good man," I said as we parked at the restaurant and walked in. "Easiest question first: Araucaria are in the Division Pinophyta, Class Pinopsida and Order Pinales, so, if you look beyond the genus, you might call them pine trees." I ordered two sweet onion desserts, and

then I saw a poster on the wall with brown papery bulbs on it. "What are those?" I asked the waitress.

"Those are the legendary Bush Onions, which have fed people here since ancient times," she smiled softly as she brushed her caramel-colored curls off her round brown cheeks. "An aboriginal person may look into the bush onion bulb and experience Dreaming—a story told of the timeless time of creation of life, people and plants. Then they render that experience abstractly, as in these," she said, extending a sinewy arm and pointing to some primal-looking paintings on the other wall.

"They look amazing!" I admired. "Onions make me dream, too... of trees. I'd love to see those more closely, when we are done with work here." She nodded and went to the next table. I slipped the data card out of the camera and into the laptop, to maximize magnification. "Codit, the pictures will reveal a pathogen much more powerful than insects, and with longer and sharper 'horns.'" Moving the cursor to the bottom of the white glob, I continued. "Since the glob is above the hole, that indicates the sap could not have come out of the hole, unless it defied gravity! Also, see how the sawdust is just on the underside of the glob, and not mixed in like it is with many pitch tubes? Could the sawdust have been thrown up from the excavation of the hole below?"

Hearing that, Codit pulled his chin out of his palm, but his eyes remained fixed on the screen as he pointed and gasped. "Some beetles can make smooth-sided circular holes, but none we know of can make a hole that large. Besides, the hole is shallow, so it could not have been made by an exiting larva. Was this hole made abiotically, by a drill?"

I moved the cursor between the branch collars and held up my hand. "Let's finish with the biotic factors first. See how the left side of the wound is very close to another pruning wound, and the bark between them is included? This inclusion disrupted the vascular flow to that area, so resources were not available for callus to form. If we could remove the white sap we might see a hole made by a smaller insect attacking

that weakness in the tree's defenses, as our *Dendroctonus* beetles attack the margins of fusiform rust infections. Anyway, this Wall 4 of callus growth looks too weak to be caused by that slight "flush cut" into the collar. The interior Walls 1-3 may be weak too. Included bark is one reason why thinning is recommended for *Araucaria*, so each branch has room for a full buttress to form."

"Excessive raising of lower branches has strained the tree's resources, but what's the other reason for thinning *Araucaria*?" Codit queried. "If overdone, thinning can disrupt biomechanics and lessen stability, right?"

"Indeed," I agreed, "If you try to teach ballerinas or branches a new dance right away, they might get hurt, or fall down! They can more easily incorporate variations on a familiar theme. Branches develop their dances over decades, so arborists must be cautious choreographers. Despite its emergent status in the canopy and its thick branching habit, the genus *Araucaria* has resisted cyclones for millennia, so it doesn't need much structural help from us. Aesthetic goals are met, as views can be dramatically improved when up to a third of the branches are pruned.

This is known as vista pruning, or windowing, the tree. Thinning in a spiral pattern, or windfirming, can also lessen the tree's odds of uprooting. Cloud pruning, inspired by Oriental culture, can form a conifer into a microcosm of the firmament. Any style of pruning can improve structure, if it improves branch attachments to the stem, or root attachments to the earth." I flipped to the image from the back of the tree. "Have you ever seen pitch flow like that? It reminds me of caramel, which is weird when you are eating caramelized onions." Codit shook his head slowly, uncertainly... then his eyes went wide.

"Wait—in a pesticide class they described how herbicides like glyphosate make cells rupture and leak." Codit recalled, slapping the table so hard I had to grab my glass to keep it upright. "The owner of that house sure was acting guilty. The evidence points beyond a reasonable doubt to plant poison poured into drill holes—nothing else could explain it!"

I grinned with pride at my apprentice's diagnostic accomplishment.

"Fascinating bit of work there, mates" a voice right behind us made us jump. Codit's chair almost fell over, but the stranger gently pushed him back straight. "Sorry to



Raising Cain causes strain: Wounds are closing poorly at the top and bottom of flush cuts, where collar tissue was removed. Excessive crown raising—removal of many lower branches strains the tree's resources, is further inhibiting closure.

eavesdrop—my name is Lachlan LaForest, and I manage this resort. Our trees hold this island paradise together, so I couldn't help but listen in. Any clearing would be a loss to us all, so we strongly encourage tree conservation. However, the urge to command a broad view can also run strong. Perhaps your window-pruning approach can strike a compromise acceptable to all. Now that you've finished your dessert—I've got the bill, I'd like to show you some of our other trees.”

We followed Lachlan outside, and strode down the hill with him. The familiar sounds of a ball bouncing off a backboard and rattling through a hoop came to our ears, but all we could see was a living wall of green along the path. Codit felt the needles and fixed his hand lens on the fascicles. “Hey Dendro,” he called out, “this is the same species of Araucaria, pruned as a hedge. So many ways we can manage trees to our, and their, benefit! Hey Mr. LaForest,” our new friend slowly came over to him, “what do you call these slender oval patterns on the bark?”

“Those are called hoops, my lad, hence the common name,” he answered, making flakes as he rubbed his thumb on the bark. “Their name, and tolerance of occasional shearing, make hoop pines quite fitting near this basketball court.” Codit groaned low and grimaced.

“That's a good one,” I laughed. “You know, TGR's, tree growth regulators, may have uneven results in pines, but applied as a soil drench they are safe and easy. They may be worth a try for viewsapes and hedges alike. I'd like to see more of your plant management here—can we walk farther?”

Codit was still shaking his head at the pitiful pun. “I'll stay and see if I can get into a game of hoops. My moves are slicker than sap, and flow like my rap...” He recited his trash talk as he shuffled around the hoop pine hedge, and out of sight.

Additional Reading

Kearney, Philip C., and Donald D. Kaufman. 1988. *Herbicides: Chemistry, Degradation and Mode of Action*. Marcel Dekker, Inc. New York, NY.



Prodigious pitch flow reflects the cascading collapse of the vascular system. Glyphosate detaches the plasma layer of the cell walls, so the cell walls explode under pressure.

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