



ISA

2021



VIRTUAL
CONFERENCE

13-16 DECEMBER

isa-arbor.com/conference

#ISAVirtual2021



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ISA Canopy Partners

Promoting the profession by investing in the industry worldwide.

The ISA Canopy Partner program is a collaborative initiative that brings together industry leaders to support ISA’s work to promote the professional practice of arboriculture, inform the public about the benefits of trees and provide a global network of

arborists, urban foresters and people who care for and about trees. This program will ensure the arboriculture consumer outreach, as well as, ISA’s work on behalf of the entire profession continues to make an impact across the industry and around the world.

For more information about this new program, contact
CorporateSales@isa-arbor.com or +1 678.367.0981 ext. 212.

Welcome to the ISA 2021 International Virtual Conference!

As we kick off this year's virtual conference, I am excited we can share knowledge and network in new and innovative ways. When we hosted our first virtual conference last year, we had no idea what to expect. Yet this new way of meeting allowed us to have our largest conference ever – with more than 3,600 attendees! We listened to your feedback from that conference – and heard your overwhelming request to continue to provide this type of engagement opportunity. We are happy to be able to host our 2nd annual virtual conference – and think this year will be even better than last.

I encourage you to use your time beyond the educational sessions and find ways to connect with your peers. This is your time to connect globally while learning locally. There are community boards for varied interests and connection points – student groups, climbers' corner, women in arboriculture, research areas, certification areas of interest – and so much more! With this virtual platform –you will connect in new and meaningful ways with peers you may have never met otherwise.

Over these next few days you will be learning from industry experts, celebrating some of the best in our profession through the ISA True Professionals of Arboriculture Awards and the Awards of Distinction sponsored by The Bartlett Tree Company, and connecting with arborists from around the globe – which we hope will lead to new perspectives and generate opportunities for collaboration, even in this virtual setting.

Thank you for taking the time to join us. We are so excited about what this event has to offer, and we look forward to learning, networking, and sharing ideas over these next few days.



A handwritten signature in black ink that reads "Caitlyn Pollihan". The signature is fluid and cursive.

Caitlyn Pollihan
CEO and Executive Director
International Society of Arboriculture



Looking Ahead



Don't miss this opportunity to attend the first ISA International Conference in Europe in more than 20 years! Join 800 plus colleagues from around the world to network and share thoughts and views on research, practice, technology, and the latest in the industry. Mark your calendars for 12–14 September 2022. Registration opens spring 2022.



Celebrate a century of professional arboriculture with ISA! Starting in Albuquerque and ending in ISA's home city of Atlanta, ISA is hosting a year of events to highlight this milestone. We'll take a look back at ISA's origins, key figures, accomplishments and look ahead to the future and what the next 100 years could bring.

2023
Albuquerque
New Mexico • USA

2024
Atlanta
Georgia • USA

First Things to Know

Getting Assistance During the Event

Our team members are available throughout the conference between 9:00 a.m. - 5:00 p.m. U.S. Eastern Standard Time each day:

- Chat by clicking the Ask the Organizers chat box located in the community tab and type your message.
- Email conferencereg@isa-arbor.com

Whova Virtual Conference Platform and App

ISA will be using Whova as the virtual platform and app for this event. Registrants will receive an invitation email before the conference starts with a link to sign into Whova, along with instructions for downloading the mobile app. The conference will be available on your computers and mobile devices, and we recommend you use both. **Chrome is the recommended browser.**

Whova will allow attendees to:

- View the agenda and plan your schedule
- Access livestreams and on-demand videos directly within sessions and use the session Q&A
- Set up virtual meet-ups with your fellow attendees and interact with speakers or organizers
- Create and converse through various discussion topics in the community board
- Receive updates (e.g. last minute session changes from the organizers)
- Please check the following guides to know more:

[How to Log in](#)

[How to Submit CEUs](#)

[How to Network \(Browser\)](#) ([Whova App](#))

[Whova: How-To-Guide](#)

On-demand sessions can be viewed directly in Whova. For live sessions you will be taken out of Whova to a Zoom meeting.

Event Timings in Different Time Zones

All times will reflect the time zone you are in while in the Whova platform and app. We encourage attendees to view the agenda within the platform to plan out their schedules. The majority of sessions will be available on demand so attendees can view them at their convenience. Additionally, sessions will be available to attendees for up to 30 days following

the end of the conference. Attendees can still view sessions, submit for CEUs, and interact with other attendees during that time.

Live Sessions vs. On-Demand Sessions

A live session will occur at the original time stated in the agenda with the ability to do live Q&A with the presenters on Zoom. These sessions will be recorded and shared later on as on-demand sessions.

On-demand sessions are sessions attendees can view at any point during the conference at their convenience. To view these simply enter the session in the agenda tab and click play.

Submitting ISA Continuing Education Units (CEUs)

This event provides attendees the opportunity to earn CEUs by participating in select sessions. If you are a current ISA credential holder, to be eligible to receive CEUs you will be required to fill out the conference CEU form with necessary information provided by the virtual platform. Additionally, ISA will track engagement and attendance time of individual attendees in each session through the platform. The CEU requirements are the same as attending an in-person conference, and these conference sessions will only be available in this format to registered attendees for 30 days following the conference. CEU codes will be given at the end of each session and will be shared both visually and audibly.

You may earn CEU credits for sessions viewed at different times than shown on the agenda as long as you view the session in its entirety and submit the CEU code provided at the end of each session. CEUs must be submitted in the online form provided within the virtual platform. ISA will not accept CEUs submitted through physical mail or other means.



All sessions can be watched on demand until 17 January 2022.
Select **"LIVE"** sessions will be available on demand after 17 December 2021.

MONDAY 13 DECEMBER

10:00–10:30 a.m.	The Science of Saw Chain	0.5 CEU A, U, T, M, L, Bp(.5)
10:00–10:35 a.m.	Effects of Residential Development on Growth of Mature Trees	0.5 CEU A, U, T, M, L, Bs(.25), Bm(.25)
10:45–11:20 a.m.	Green Barriers to Reduce Pollution: Results of a Long-Term Experiment	0.5 CEU A, U, T, M, L, Bs(.25), Bp(.25)
10:45–11:20 a.m.	Knuckle Booms and Cranes	0.5 CEU A, U, T, M, L, Bp(.5)
11:30 a.m.–12:10 p.m.	The Importance of Arboriculture Trade Schools	0.5 CEU A, U, T, M, L, Bp(.25), Bm(.25)
11:30 a.m.–12:00 p.m.	Expanding Florida Tree Species Availability: A Chicken and Egg Situation	0.5 CEU A, M, Bp(.5)
12:15–12:45 p.m.	Contract Climbers: An Untapped Training Resources	0.5 CEU A, T, M, L, Bm(.5)
12:15–12:50 p.m.	Evaluation of Non-Invasive Methods for Root Research in Paved Sites	0.5 CEU A, M, Bs(.25), Bm(.25)
12:55–1:00 p.m.	UAA Safety Vignette #1	
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
2:15–2:45 p.m.	Assesing Quality and BMP's for Alternative Irrigation Sources for Trees	0.5 CEU A, M, L, Bp(.5)
2:15–2:55 p.m.	Bad Inheritances in Arboriculture	0.75 CEU A, U, T, M, L, Bs(.25), Bp(.5)
3:00–3:30 p.m.	Landscape Soil Testing	0.5 CEU A, U, T, M, L, Bp(.5)
3:00–3:30 p.m.	Enmiendas al Suelo Para Mejorar el Establecimiento de Arbolado Urbano	0.5 CEU A, T, M, L, Bp(.5)
4:30–5:00 p.m.	Global Perspectives on Prof. Identity in Urban Forestry	0.5 CEU A, U, T, M, L, Bm(.5)
5:00–6:00 p.m.	Global Perspectives on Prof. Identity in Urban Forestry (LIVE Q&A 60 Minutes)	1 CEU A, U, T, M, L, Bm(1)
6:00–7:00 p.m.	Early Career and Student Panel	



A

T

L

M

U

B s/m/p

s=Science • m=Management • p=Practice

Number of CEUs determined by length of session.



All sessions can be watched on demand until 17 January 2022.
Select **"LIVE"** sessions will be available on demand after 17 December 2021.

TUESDAY 14 DECEMBER

10:00–11:00 a.m.	Opening General Session and Keynote	1 CEU A, U, T, M, L, Bs(1)
11:15–11:50 a.m.	Tree Failure From Sidewalk Construction and Storms	0.5 CEU A, U, T, M, L, Bm(.5)
11:15–11:45 a.m.	Artificial Intelligence for Tree Risk Prediction	0.5 CEU A, U, T, M, L, Bm(.5)
12:00–12:20 p.m.	ISA Lightning Presentations	0.5 CEU A, M, Bs(.25), Bp(.25)
12:20–12:35 p.m.	Desarrollo Del Sistema Radical De Ahuehuate En Un Area Urbana	
12:45–1:15 p.m.	AREA Student Grant Presentations	
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
2:00–2:40 p.m.	Understanding Wind and Tree Interaction Improves Advanced Tree Risk Assessments	0.75 CEU A, U, T, M, L, Bs(.25), Bm(.5)
2:00–2:40 p.m.	Organize and Get Acceptance For Tree Plantings Around Public Housing!	0.75 CEU A, M, Bs(.25), Bp(.5)
2:45–3:25p.m.	Residential Trees and The Knowledge, Perceptions, and Practices	0.5 CEU A, U, T, M, L, Bm(.5)
2:45–3:15p.m.	Risk Management of Urban Trees in Japan	0.5 CEU A, U, T, M, L, Bp(.25), Bm(.25)
3:30–4:00 p.m.	Urban Forestry as a Tool for Biodiversity Conservation	0.5 CEU A, U, T, M, L, Bs(.25), Bp(.25)
3:30–4:10 p.m.	Assessing and Managing Aging Urban Trees	0.75 CEU A, U, T, M, L, Bm(.75)
4:00–4:10 p.m.	UAA Safety Vignette #2	
4:15–5:15 p.m.	ISA Awards	
5:30–7:00 p.m.	LIVE Women in Arboriculture	1.5 CEU A, U, T, M, L, Bm(1.5)

**COMING
SOON!**

Arborists' Certification Study Guide Fourth Edition

Stay tuned for the fourth edition of one of our most popular products. Releasing early spring 2022.



All sessions can be watched on demand until 17 January 2022.
Select **"LIVE"** sessions will be available on demand after 17 December 2021.

WEDNESDAY 15 DECEMBER

10:00–11:00 a.m.	ISA's BMP for Construction Near Trees	1 CEU A, U, T, M, L, Bm(1)
11:00–11:30 a.m.	ISA's BMP for Construction Near Trees (LIVE Q&A 30 Minutes)	0.5 CEU A, M, Bm(.5)
11:45 a.m.–12:35 p.m.	Inclusive Community Engagement in Urban Forestry: Beyond the Online Survey	0.75 CEU A, U, T, M, L, Bm(0.75)
12:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
1:00–2:00 p.m.	ISA BCMA™ Peer-to-Peer Session	
2:15–2:45 p.m.	Urban Forests for Public Health–Optimising the Impact	0.5 CEU A, U, T, M, L, Bm(.5)
2:15–2:45 p.m.	New Approaches for Protecting and Retaining Private Trees	0.5 CEU A, U, T, M, L, Bm(.5)
3:00–3:50 p.m.	Tree Inspections, Assessments, Failures and Fatalities	0.75 CEU A, U, T, M, L, Bm(.75)
3:00–3:40 p.m.	Machine-Generated Risk Assessment Reports	0.75 CEU A, U, T, M, L, Bm(.75)
3:45–4:20 p.m.	'20 Chadwick Award Winner: The Feasibility Of Soil Applied Systemic Inducing Agents For Tree Disease Management	0.5 CEU A, U, T, M, L, Bs(0.5)
4:45–6:00 p.m.	TREE Fund After Hours	



TCC Gear Check Best Practices

NEW

This free video covers how to properly conduct a gear check. Expert and ITCC Head Technician Phillip Kelley demonstrates how it can be done effectively, what to look for if you are training others, and best practices when submitting gear for ISA competitions. An accompanying quiz is available for purchase with the opportunity to earn 1 CEU (A, T, Bp, L).

Presented by Husqvarna

Find this video and accompanying quiz at: www.isa-arbor.com/store



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THURSDAY 16 DECEMBER

10:00–11:00 a.m.	Growing and Anchoring Trees on Elevated Structures	1 CEU A, U, T, M, L, Bp(1)
11:00–11:30 a.m.	Growing and Anchoring Trees on Elevated Structures (LIVE Q&A 30 Minutes)	0.5 CEU A, T, M, L, Bp(.5)
11:45 a.m.–12:15 p.m.	The Revised Integrated Vegetation Management BMP	0.5 CEU A, M, L, Bm(.5)
11:45 a.m.–12:20 p.m.	Pesticide Alternatives to Specific Tree Pests	0.5 CEU A, U, T, M, L, Bs(.5)
12:30–1:00 p.m.	Building a Model Tree Ordinance to Enhance and Maximize Tree and Urban Forest Benefits While Reducing Tree and Power Line Conflicts	0.5 CEU A, U, T, M, L, Bs(.25), Bm(.25)
12:30–1:00 p.m.	Resistance Recording Measurements and Tomography: Concepts and Applications	0.5 CEU A, U, T, M, L, Bm(.5)
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
1:00–2:00 p.m.	Designing Resilient Communities with Trees: The Green Neighborhood Program	1 CEU A, U, T, M, L, Bp(.5), Bm(.5)
2:00–2:30 p.m.	The Meaning of Tree Biomechanics To Tree Health Care Providers	0.5 CEU A, U, T, M, L, Bs(.25), Bp(.25)
2:00–2:35 p.m.	Woody Plant Biodiversity Explains Arthropod Management Interventions in Residential Landscapes	0.5 CEU A, U, T, M, L, Bs(.25), Bp(.25)
2:30–4:30 p.m.	Urban Tree Growth Business Meeting	
3:00–4:00 p.m.	Visit Partner Profiles and Career Fair	
4:30–5:00 p.m.	2021 ISA International Virtual Conference Closing Session	





Joe Arborist
NO-1234A

Vinyl Vehicle Decals

Two pack of 8"x 18.5" vinyl, ISA Certification decals that include customization with your certification ID and name.

isa-arbor.com/store



“As soon as I saw it, I knew that this was the future.”

Richard Mowbray - Mowbray's Tree Service

TREE-CARE HANDLERS

“THE GAME CHANGERS”

SENNEBOGEN is changing the landscape for tree care specialists with a dramatically new lineup of machines designed to accelerate production and keep tree workers safe.

Built on the same platform as SENNEBOGEN's industry-leading material handlers, these tree-care machines extend a telescoping boom to precisely position a powerful grapplesaw. One operator can grasp, cut and place limbs and whole trees in a single, smooth motion – all from the safety of SENNEBOGEN's hydraulically elevating Maxcab.

Tree Care Services

- One system, one operator to dismantle, trim & cut to size, stack logs, load to trucks or feed processing equipment

Land Clearing

- Powerful and efficient cutting and stacking for high production and minimal cleanup

Roadside Maintenance

- Long reach for safe cutting and mowing across culverts and down embankments

Right-of-Way Clearance

- One piece of equipment to cut precisely above and below utility lines, clear brush and stack material



“Anytime you can take a climber out of the tree, you have made the job safer.”

Rich Kingsborough – Atlas Tree Surgery



718 M
Rubber Tired

718 R-HD
Crawler Tracks

728 M
Rubber Tired

728 R-HD
Crawler Tracks

738 M
Rubber Tired

738 R-HD
Crawler Tracks

Net power	119 kW (160 HP)	119 kW (160 HP)	129 kW (173 HP)	129 kW (173 HP)	168 kW (225 HP)	168 kW (225 HP)
Operating weight	21,400 kg (47,180 lb)	28,100 kg (62,000 lb)	29,000 kg (65,000 lb)	41,000 kg (90,390 lb)	43,400 kg (95,700 lb)	46,000 kg (101,413 lb)
Max reach	13 m (43')	13 m (43')	20 m (65')	20 m (65')	23 m (75')	23 m (75')
Max load (@ full reach)	1,700 kg (3,700 lb)	1,700 kg (3,700 lb)	1,700 kg (3,700 lb)	1,700 kg (3,700 lb)	1,860 kg (4,100 lb)	1,860 kg (4,100 lb)

Get the details online @ sennebogen-na.com/tree-care

Thank You to Our Sponsors

Platinum



Gold



Silver



Bronze



Games and Networking

Community Leaderboard Contest

Be an active participant! Attendees will earn points based on their participation in the community boards, photo submissions, event polls and surveys. Top participants will be entered to win a prize from one of our sponsors!

Virtual Company Profile/Arbor Workforce Hub Scavenger Hunt

Step 1 - Find the [KEYWORDS]

Visit each Partner profile page under the Partner tab to find key words that look like this between brackets [EXAMPLE]. A clue will be provided in the "Extras" tab on the app home screen. Take some time to learn about each Partner!

Step 2 - Complete the secret phrase:

Rearrange all of the found [KEYWORDS] on the provided form in the Extras tab to complete the secret phrase. Winners will be drawn at random from the correctly submitted secret phrases. Winners will be notified by ISA team members via the Whova app.

*Non-US winners may receive monetary equivalent gift cards or promotion code.

Photo Contest

Post your photos of 'Arborists in Action'. The top photos will be entered into a drawing for prizes provided by sponsors! Winners will be contacted via email on Thursday, 16 December before 5:00 p.m. ET. We will also announce winners on social media.

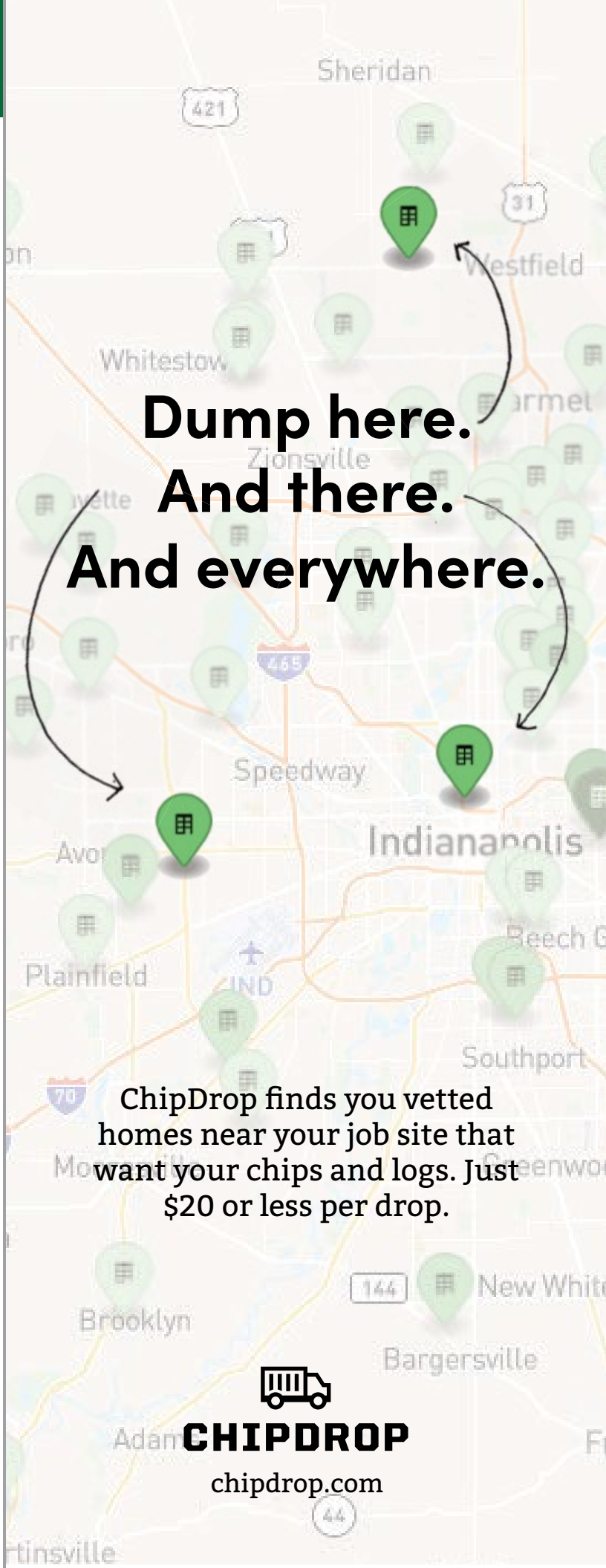
Use Whova to connect

On the Whova mobile app:

Click the Attendees tab on the bottom of the screen to browse the attendee list. At the top of the Attendees page, you can search attendees by keywords. In their professional profiles, you can take notes or request contact information. Say 'hi' with one click or start a private chat by clicking the "Message" button.

On the Whova desktop platform:

Click on the Attendees tab on the left side of the screen under Main Navigation. At the top of the Attendees page, you can search by keywords such as 'company name' or 'title'. To start a conversation, click Send Message to begin a chat.



**Dump here.
And there.
And everywhere.**

ChipDrop finds you vetted homes near your job site that want your chips and logs. Just \$20 or less per drop.



CHIPDROP

chipdrop.com

ISA has curated a student track to help individuals entering the industry with suggested sessions. We encourage you to view these sessions as well as any others that might interest you. Thank you to The Davey Tree Expert Company for being the ISA International Virtual Conference Student Sponsor and encouraging continued support for students in this field.

MONDAY 13 DECEMBER

11:30 a.m.–12:10 p.m.	The Importance of Arboriculture Trade Schools	0.5 CEU A, U, T, M, L, Bp(.25), Bm(.25)
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
4:30–5:00 p.m.	Global Perspectives on Prof. Identity in Urban Forestry	0.5 CEU A, U, T, M, L, Bm(.5)
5:00–6:00 p.m.	Global Perspectives on Prof. Identity in Urban Forestry (Live Q&A 60 Minutes)	1 CEU A, U, T, M, L, Bm(1)
6:00–7:00 p.m.	Early Career and Student Panel	

TUESDAY 14 DECEMBER

10:00–11:00 a.m.	Opening General Session and Keynote	1 CEU A, U, T, M, L, Bs(1)
12:45–1:15 p.m.	AREA Student Grant Presentations	
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
2:45–3:25p.m.	Residential Trees and The Knowledge, Perceptions, and Practices	0.5 CEU A, U, T, M, L, Bm(.5)

WEDNESDAY 15 DECEMBER

12:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
2:15–2:45 p.m.	Urban Forests for Public Health–Optimising the Impact	0.5 CEU A, U, T, M, L, Bm(.5)
3:45–4:20 p.m.	'20 Chadwick Award Winner: The Feasibility Of Soil Applied Systemic Inducing Agents For Tree Disease Management	0.5 CEU A, U, T, M, L, Bs(.5)

THURSDAY 16 DECEMBER

10:00–11:00 a.m.	Growing and Anchoring Trees on Elevated Structures	1 CEU A, U, T, M, L, Bp(1)
1:00–2:00 p.m.	Visit Partner Profiles and Career Fair	
1:00–2:00 p.m.	Designing Resilient Communities with Trees: The Green Neighborhood Program	1 CEU A, U, T, M, L, Bp(.5), Bm(.5)
4:30–5:00 p.m.	2021 ISA International Virtual Conference Closing Session	

Thank you to the ISA Student Sponsor



All sessions can be watched on demand until 17 January 2022. Select **"LIVE"** sessions will be available on demand after 17 December 2021.

During this season of gratitude, we are thankful for:

**The students who we sponsored.
You give us hope for the next generation.**

**The attendees at the conference.
We are honored to be among you.**

**Our #greenleaders who serve as volunteers,
in leadership and as presenters.**

You make us proud.





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Select “**LIVE**” sessions will be available on demand after 17 December 2021.

MONDAY 13 DECEMBER

10:00–10:30 a.m.

The Science of Saw Chain

--Mattias Karlsson and Jakob Lagerwall

Why do different saw chain tooth types exist? What's the difference? We'll discuss the history and geometry of chainsaw chains and how this impacts cutting capacity. We'll also review the need for maintenance and filing and why it can also impact your ability to cut effectively.

10:00–10:35 a.m.

Effects of Residential Development on Growth of Mature Trees

--Greg King

This research utilizes dendrochronology (science of annual tree-ring analysis) to investigate the long-term influence of residential development on tree growth indices. It is an opportunity to compare trees in adjacent greenspaces that were not impacted by development. The results will be informative for those interested in a decades-long perspective on the impacts of development on tree growth.

10:45- 11:20 a.m

Green Barriers to Reduce Pollution: Results of a Long-Term Experiment

--Francescori Ferrini

A 2014 study on the effect of different species of evergreen shrubs on the dynamics of some heavy metals deposition and of three different fractions of particulate matter was started. The research, still running, has shown that, in addition to the choice of species, a significant importance in reducing pollution is also covered by the arrangement of plants and their management. This information will be useful for planning green barriers aimed at reducing pollution, but also for selecting tree species with better performances in reducing dust concentration in the air.

10:45- 11:20 a.m.

Knucklebooms and Cranes

--Mark Moeske

Knucklebooms are cranes. This presentation will go through what you need to know to safely work with all cranes within the tree care industry.

11:30 a.m.–12:10 p.m.

The Importance of Arboriculture Trade Schools

--David Vincent

With the push for sending students to college as high as ever, recruiting and training for skilled trades is becoming more important. ISA Michigan has been working to construct a 10-day pilot program with a grant from the DNR. This pilot program pulls highly skilled arborist trainers together to teach entry level students the skilled trade of arboriculture. After completion of this course, the students are certified in four TCIA Tree Care Academy programs and have spent 80 hours receiving hands-on training running chainsaws, chippers, and aerial lifts while climbing trees and learning proper pruning techniques.

11:30 a.m.–12:00 p.m.

Expanding Florida Tree Species Availability: A Chicken and Egg Situation

--Deborah Hilbert

Why is there a limited pallet of tree species available and planted in cities? How would green industry professionals approach expanding this pallet? This presentation summarizes the results of a series of research focus groups in which wholesale tree growers and large-scale purchasers of trees in Florida discussed these critical questions and potential solutions.

12:15–12:45 p.m.

Contract Climbers: An Untapped Training Resource

--Craig Bachmann

The profession of arboriculture continues to struggle with a lack of training resulting in injuries, fatalities and property damage. This is particularly true for small companies that are not ready to hire a qualified crew supervisor. Professional contract climbers offer a unique solution to improve crew safety and productivity. Learn how a professional contract climber can help improve knowledge, skills and safety culture and your company.

12:15–12:50 p.m.

Evaluation of Non-Invasive Methods for Root Research in Paved Sites

--Alession Fini

This research was conducted to: (1) evaluate the capacity of GPR and sonic tomography to locate roots and predict root density of urban trees in paved sites; and (2) evaluate the effects of pavement typology on the root system characteristics on urban trees. Ground penetrating radar, sonic tomography, and airspading were used to assess root number, root density, root slenderness and rooting depth on *Celtis australis* and *Fraxinus ornus* plants, planted nine years before in soils covered with different types of pavements, or left unpaved. The presentation will also provide a theoretical rationale for using non-invasive methods for studying roots.

12:55–1:00 p.m.

UAA Safety Vignette #1

This PSA discusses a new hazard arborist may encounter on the jobsite and what basic steps should be taken to avoid injury or eye damage. Fictional professional utility arborist discuss the dangers of working near small cellular towers, and how to best prepare for such situations.

2:15–2:45 p.m.

Assessing Quality and BMPs for Alternative Irrigation Sources for Trees

--Raul Cabrera

This presentation will address key components of water quality, including salinity, alkalinity, pH, specific

ion toxicity and deficiency, and how they affect tree growth and aesthetics. Examples will be provided from good quality sources and alternative irrigation water sources. Assessment of water quality from laboratory reports, and monitoring of water quality with field instruments, and considerations of management practices to deal with marginal water sources when irrigating trees will also be covered.

2:15–2:55 p.m.

Bad Inheritances in Arboriculture

--Carlos Llanos

The incorrect interventions applied to trees in cities and in all latitudes severely injure adult trees. In the short term, these trees are unable to replace the support and nutrition functions performed by their roots, and, as long as the tree remains open, fungi, insects, and a number of other pathogens can enter through the cuts. Improvisation causes several root pruning to occur in the same tree, and leads to the collapse of the tree with consequences we're all familiar with in some dramatic cases.

3:00–3:30 p.m.

Landscape Soil Testing

--Linda Chalker-Scott

Increasingly we recognize the importance of soil testing before prescribing use of fertilizers, but all soil tests are not created equally: agricultural soil metrics are not appropriate for use in landscapes. Moreover, we can correlate relevant soil test data with careful site observations to learn more about what constitutes sustainable levels of organic matter and nutrient levels. Learning how to interpret soil tests by ground-truthing with site conditions allows arborists and landscape managers to understand how rhizospheres are currently functioning and what, if anything, should be added.

3:00–3:30 p.m.

Enmiendas al Suelo Para Mejorar el Establecimiento de Arbolado Urbano

--Luis Manuel Morales Gallegos

Un factor que limita el desarrollo del arbolado urbano es la condición del suelo. El objetivo de este trabajo fue evaluar la enmienda de carbohidratos (glucosa y sacarosa) al suelo urbano para estimular el crecimiento y vitalidad de árboles de Jacaranda

mimosifolia D. Don. Se utilizaron ocho tratamientos y un control (agua). Se evaluó incremento en altura y diámetro, color de follaje, fluorescencia de la clorofila, materia seca de raíces, almidón en raíces y respiración del suelo. Los resultados indican que el incremento en altura y diámetro, color del follaje y la fluorescencia de la clorofila no presentaron diferencias significativas entre tratamientos. Por el contrario, el peso seco de raíces, su contenido de almidón y la respiración del suelo mostraron diferencias estadísticas, utilizando una concentración mayor de carbohidratos. La enmienda de carbohidratos al suelo urbano, estimuló la respiración del suelo y el crecimiento de raíces de J. mimosifolia.

4:30–5:00 p.m.

Global Perspectives on Professional Identity in Urban Forestry

5:00–6:00 p.m.

Live Q&A

--Susan Day, Paul Ries, Martha Barwinsky, Wendy Chen, Danielle Gift, Mario Vagner Jaldin Quispe, Cecil Konijnendijk, John Parker, and Mark Roberts

Arborist, forester, urban forester – what do professionals call themselves, and what does the data say? We will present trends in professional identity and integrate new findings from an international survey of 750 urban forestry professionals where respondents shared insights about their careers and professional identity in urban forestry. This event includes a research presentation followed by an in-depth panel discussion about topics critical to the future of these professions.

We will engage panelists in exploring the evolving interactions of established professions and their influence on professional identity and professional practice for the rapidly emerging profession of urban forestry in both national and international contexts. We will discuss implications for the future of credentialing, career paths, professional societies, education, and emerging professionals. Panelists from: Asia, the United Kingdom, Canada, the United States, Europe, New Zealand, and Latin America.

TUESDAY 14 DECEMBER

10:00–11:00 a.m.

Opening Keynote: Tree Story: What We Can Learn About Human, Climate, and Forest History from the Rings in Trees

--Valerie Trouet

Dendrochronology: the study of the rings in trees, allows us to study climate history over the past 2,000 years and to put current climate change in a long-term context. We can use tree rings to study past mean climate, but also climate extremes - such as drought, hurricanes, and wildfires - and dynamical patterns, such as the jet stream. In addition to this, dendrochronology sits at the nexus of climatology, ecology, and archeology and helps us to link climate history to forest history and human history.

11:15–11:50 a.m.

Tree Failure From Sidewalk Construction and Storms

--Eric North

This presentation will quantify in tree growth response over time of trees that survive root severance or root disturbance as a result of sidewalk construction and the probability of tree failure from storm events. Damage to urban trees can begin with wind speeds as low as 25 miles per hour, especially when those trees harbor defects that predispose them to structural failures. The tree damage triangle integrates the three main factors that influence tree failures during wind loading events: site characteristics, the (wind) loading event and any defects of the trees. The research reveals critical pre-existing conditions leave trees vulnerable to whole tree losses: large trees in limited boulevard widths and severed roots as a result of sidewalk repair.

11:15–11:45 a.m.

Artificial Intelligence for Tree Risk Prediction

--Ryan Suttle and Nasko Apostolov

Vegetation management is typically one of a utility's largest budget items. Presently, identification of high-risk trees near utility lines is labor intensive, time consuming, and costly. This study describes a machine learning approach which trains a novel convolutional neural network (CNN) to automatically

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classify trees, using only a single photograph and with a high degree of accuracy, into likelihood of failure categories. The CNN's high degree of accuracy demonstrates the potential of artificial intelligence to automate risk assessment and consequently to reduce costs. Preliminary results are extremely promising for future study and improvement.

12:00–12:20 p.m.

ISA Lightning Presentations:

Diseases of *Quercus*, *Oxydendron arboreum*, and *Tsuga* Species in Nurseries

--Stephanie Adams

This presentation will cover the three host-plant chapters (*Quercus*, *Oxydendron arboreum*, and *Tsuga*) in the book *Diseases of Woody Ornamentals and Trees in Nurseries*. This reference book covers abiotic disorders, diseases, diseases by host, disease management, and general diagnostics. It further goes into Disease Frequency, Disease Severity, Chemical Treatment, Cultural Practice, Sanitation, and Resistant Cultivars.

Soil Physical Condition For Growth of *Cerasus Campanulata*

--Ying Jin

Soil conditions in urban areas may not be conducive for growth of the plant *Cerasus campanulata*. In particular, soil solidity due to tread pressure and poor drainage is a major problem. Nevertheless, *C. campanulata* and its hybrid species are planted in urban areas. This study investigated the effects of the different physical conditions of soil on the growth of *C. campanulata*. The results showed that poor drainage adversely affected the growth of *C. campanulata*, and have relationships with native distribution at slope in the mountain.

12:20–12:35 p.m.

Desarrollo Del Sistema Radical De Ahuehuete En Un Area Urbana

--Pablo Hernandez-Lopez

Taxodium mucronatum Ten. (ahuehuete) es plantado frecuentemente en áreas verdes urbanas, en condiciones de humedad restringida y suelos compactados; lo que influye en su crecimiento y supervivencia. El objetivo de investigación fue identificar los efectos de la frecuencia de riego y aflojamiento del suelo circundante a la cepa de plantación, sobre el crecimiento de raíces de árboles jóvenes de ahuehuete. Se plantaron 24 árboles, el crecimiento radical se evaluó a través de fotografías digitales obtenidas de rizotrones, instalados en una pared de la cepa de plantación de cada árbol. Los árboles que fueron tratados con riego frecuente y suelo sin aflojamiento desarrollaron mayor número de raíces. Se concluye que la interacción frecuencia de riego y condición de suelo tiene efecto sobre el número de raíces, pero no sobre la longitud. Sin embargo, el resultado se basa en la información de la parte visible del sistema radical de los árboles.

12:45–1:15 p.m.

AREA Student Grant Presentations

--Stephanie Cadaval, Saif Shahrukh, Ethan Apisa, Eden Clymire-Stern

1:00–2:00 p.m.

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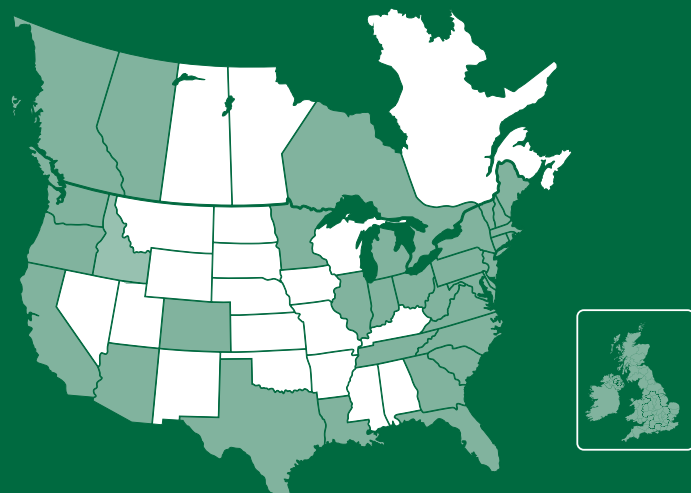


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2:00–2:40 p.m.

Understanding Wind and Tree Interaction Improves Advanced Tree Risk Assessments

--Andreas Detter

Wind plays an important role in understanding the likelihood of tree failure. Researchers have developed a better understanding of how trees interact dynamically with the wind during storms. Engineers are able to model the behaviour of wind in a built environment. Furthermore, researchers study the dissipation of wind energy within a tree and within tree stands. Independent of the applied method, understanding wind and tree interaction could improve tree risk assessments. The state of the art of practical wind load analysis and special aspects of frequently applied methods of tree risk assessment will be discussed.

2:00–2:40 p.m.

Organize and Get Acceptance For Tree Plantings Around Public Housing!

--Johan Östberg

In 2021 and 2022 the municipal housing company (MKB) in Malmö, Sweden, is planting over 500 trees, one per employee. The trees are being planted in an effort to capture carbon and reduce the negative impacts of climate change: however, to make sure the right trees are planted in the right places, all trees in all the companies housing areas are being inventoried, which include over 15,000 trees. All new tree plantings are based on specific criteria e.g. that they should increase tree diversity by not being a species that are common in the surrounding areas. The trees also need to become large individuals, and they also need to improve the wellbeing of the people living in the public housing apartments.

2:45–3:25 p.m.

Residential Trees and The Knowledge, Perceptions, and Practices

--Kaitlyn Pike

As a follow-up to a study exploring the efficacy of a comprehensive tree preservation ordinance. Our study found that comparison homeowners (where recent construction had not taken place) were longer-term residents with a greater appreciation for trees near their homes, compared to study homeowners who had just built new homes. Study

homeowners underestimated the impact their recent development had on trees and were surprisingly disengaged from the decision-making process. These results show that homeowners are largely uninformed about the home development process and its impact on the urban canopy and are even removed from decisions about their own yard. This study emphasizes the importance of an ordinance that requires tree preservation during construction.

2:45–3:15 p.m.

Risk Management of Urban Trees in Japan

--Tadashi Touchi

This session is about the history and current status of urban trees diagnosis in Japan. Tree diagnosis in Japan developed based on VTA methods and diagnostic tools from Europe and the US. The Urban Tree Diagnosis Association was established in 1998 and created the standard of diagnosis for street trees with Tokyo municipal government. The association has also made the certification for arborist specializing in street tree diagnosis for leveling the technology. With the revision of road greening standards of government two years ago, the technology is beginning to spread to local governments now. Our next vision of the association is to develop urban forestry in Japan.

3:30–4:00 p.m.

Urban Forestry as a Tool for Biodiversity Conservation

--C Elizabeth Hamilton

Urban Forest design, management, and budgeting can reflect an ecological approach to provide urban biodiversity "hotspots." This presentation will address the funding needs, arboriculture industry role, quality control and ecological foundation of the presented thesis. The arboriculture community has a voice in the fight and can help support and/or lead the development of urban forestry offices guided by ecologically sound management and planning. This approach utilizes soils biology, microclimatic constraints, and community diversity to design and manage urban forest habitats for optimal health and optimal biodiversity. Biodiversity hotspots can provide the genetic resources to help conserve species losses due to the climate crisis and make cities healthier.

3:30–4:10 p.m.

Assessing and Managing Aging Urban Trees

--Philip Van Wassenauer

While aging urban trees provide a wealth of benefits to the residents who live amongst them, they may also begin to pose more risk, and as urban centres become increasingly dense, trees, people and infrastructure often come into conflict. Balancing these competing interests while looking out for the trees can be a real challenge. Today's arborists can choose from a wealth of methods to better manage and assess the risk of trees. The recently introduced ANSI A300 Part nine describes three levels of risk assessment. By presenting a series of case studies, this talk will focus on how advanced risk assessment methods (Level 3) are being used to better understand the likelihood of failure and to contribute useful information used in the development of conservation management strategies for aging and significant urban trees.

4:00–4:10 p.m.

UAA Safety Vignette #2

This PSA discusses an invisible hazard all arborists should be aware of and know how to mitigate risk around. Fictional professional utility arborist discuss the dangers of working near downed powerlines or energized objects and how to best prepare to avoid or escape such situations.

4:15–5:15 p.m.

ISA 2021 Awards of Distinction, Presented by Bartlett Tree Experts, and True Professionals

Join us as we recognize the ISA 2021 Awards of Distinction and True Professional winners for their outstanding achievements in the arboriculture profession.

5:30–7:00 p.m.

Women in Arboriculture

--Konstanze Fabian

This session will focus on the importance of building and maintaining networks among female members of the industry and the positive benefits to individuals and organizations of all sizes. The workshop will also review common pain points with a significant focus on small, simple steps you can take to break the short-and long-term cycles. Networking after presentation.

WEDNESDAY 15 DECEMBER

10:00–11:00 a.m.

ISA's Best Management Practice for Construction Near Trees

11:00–11:30 a.m.

Live Q&A

--Tom Smiley, Richard Haier, Ryan Gilpin, Nelda Matheny

With the adoption of the newly revised ANSI A300 standard for managing trees on construction sites, the ISA updated the BMP. This presentation will review the new standard and discuss the science and practice behind the changes. The presentation is highly recommended for arborists who deal with construction protection for tree.

11:45 a.m.–12:35 p.m.

Inclusive Community Engagement in Urban Forestry: Beyond the Online Survey

--Ryan Allen, Abby Beissinger, and Ritchie Bamlet

This panel will highlight findings and lessons learned from public online surveys, describe the Urban Forest Summit Model and offer a pathway for municipalities to begin to reimagine the community engagement process—not as just a box to check in a process, but as one of the most important components of project success and implementation.

12:00–2:00 p.m.

Visit Partner Profiles and Career Fair

1:00–2:00 p.m.

ISA BCMA™ Peer-to-Peer Session

ISA Board Certified Master Arborists are invited to attend an exclusive opportunity to learn from their peers worldwide. ISA will host three different networking groups; each have a peer moderator.

2:15–2:45 p.m.

Urban Forests for Public Health - Optimising the Impact

--Cecil Konijnendijk

What urban forest components or elements offer the highest health benefits in specific circumstances and contexts? Answering this question is very important for planning, design and management. A large urban park will fulfill a different role than a peri-urban woodland, and street trees make different contributions to our health and wellbeing than community gardens. The greenness of the neighbourhood and the presence of visible green are crucial for our mental wellbeing, while parks and green connections are very important for promoting physical activity. While developing the best possible configuration of urban forests, it is also essential to address possible health inequalities and the risk of green gentrification. Finally the 3-30-300 rule for urban forestry will be presented as a way of promoting the health benefits of urban forests.

2:15–2:45 p.m.

New Approaches for Protecting and Retaining Private Trees

--Camilo Ordóñez Barona

We provide a global outlook on innovative regulations and incentives being used for protecting and retaining trees on private urban land. In this presentation we reflect on the prospective effectiveness and implications of these mechanisms and how to apply key principles for developing your own innovative approaches.

3:00–3:50 p.m.

Tree Inspections, Assessments, Failures and Fatalities

--Gregory Moore

The focus on arborists sharpens when someone is killed by a falling branch or tree. There is media attention, police inquiries and an investigation by the coroner's office. Arborists may provide expert advice, but can come under scrutiny for potential negligence. As a consequence of findings on tree related fatalities, recommendations were made by the Victorian (Australia) Coroner that established a framework for urban tree management of trees on public land.

3:00–3:40 p.m.

Machine-Generated Risk Assessment Reports

--James Komen

Watch a demonstration on how to turn an Excel spreadsheet file of tree risk assessment data into a plain English written report in a matter of minutes. The presentation focuses on excel formulas, coding, keyboard shortcuts and formatting tips that can save participants a great deal of time in their report writing. In about 30 minutes, the presenter will turn a 65-line excel sheet into a 20+ report. Participants can download a file with the formulas discussed: <http://www.jameskomen.com/resources/Risk%20Assessment%20Spreadsheet%20File.xlsx>.

3:45–4:20 p.m.

'20 Chadwick Award Winner: The Feasibility Of Soil Applied Systemic Inducing Agents For Tree Disease Management

--Dr. Glynn Percival

During their life cycle, urban trees are susceptible to many pathogenic fungi and bacteria that, if uncontrolled, can result in high mortality rates. Systemic induced resistance (SIR) is the phenomenon whereby a plant's own defence mechanisms are enhanced by a biological or chemical agent. Work at the UK/Ireland Bartlett Tree Research Laboratory has, over the past five years, evaluated the influence of a range of soil applied inducing agents (chitin/chitosan, phosphites, biochar, salicylic acid) singly and in combination. This presentation will provide an update as to which inducing agents and/or combinations of inducing agents are the most effective as well as application rates and timing. Data will be presented from field and urban landscape trials.

4:45–6:00 p.m.

TREE Fund After Hours

Please join TREE Fund for a Virtual TREE Fund After Hours. TREE Fund will provide an update on their activities, award this year's Volunteer of the Year, recognize the success of this year's Tour des Trees riders and celebrate the importance of their mission with the help from a few friends.

10:00–11:00 a.m.

Growing and Anchoring Trees on Elevated Structures

11:00–11:30 a.m.

Live Q&A

--Jason Lubar and Laura Hansplant

Many cities are setting tree cover canopy goals. Ground-level tree planting is relatively straightforward, but more tree planting opportunities exist on rooftops and other elevated structures, which comprise a significant percentage of urban impervious surface. The functionality of these rooftop oases can be dramatically increased when complimented with large maturing trees. However, growing and anchoring trees on elevated structures present many challenges, such as ensuring wind stability, managing weight and minimizing risk from multi-story branch drop. We will define, explore, discuss, address these challenges and increase your knowledge of horticultural systems specialized for high-elevation urban trees.

11:45 a.m.–12:15 p.m.

The Revised Integrated Vegetation Management Best Management Practices

--Randall Miller

This presentation offers an overview of the third edition of the ISA Integrated Vegetation Management (IVM) BMP. It deemphasizes IVM on electric rights of way to provide an approach that can be applied to a broad array of applications. Chemical controls are also de-emphasized in favor of biological control. The objectives of the presentation are that attendees will be able to: recognize the differences between the current and past editions of the IVM BMP, explain the IVM process programmatically, identify IVM control methods and describe the appendices in the IVM BMP.

11:45 a.m.–12:20p.m.

Pesticide Alternatives to Specific Tree Pests

--Sean Sewell

This talk will introduce you to several beneficial insects and nematodes, and how you can use them

to work for you in controlling many insect pests. Imagine releasing hundreds of tiny assassins onto a tree whose only mission in life is to destroy your mutual enemies. This is the win/win scenario that is possible when you put predatory insects and nematodes to work in your client's landscape. No more mixing or storing harmful pesticides and no more worry about applicator exposure. The best part is you don't have to grow and cultivate them yourself, you can purchase them commercially and let them start working for you.

12:30–1:00 p.m.

Building a Model Tree Ordinance to Enhance and Maximize Tree and Urban Forest Benefits While Reducing Tree and Power Line Conflicts

--Lawrence Kahn

Based on the recent work of Tulane University's Utility Vegetation Management Initiative, work has begun on the development of a model tree ordinance. This effort is focused on the development of a model tree ordinance that encourages concepts like Right Tree Right Place, Trees for Energy Conservation and the proactive mitigation of existing threats to the energy infrastructure. This presentation will review the status of this effort which is currently being led by Arbor Day, Tulane University and other key experts and organizations in the UVM industry.

12:30–1:00 p.m.

Resistance Recording Measurements and Tomography: Concepts and Applications

--Jamie Lim

Jamie is an ISA Board Certified Master Arborist with 11 years of experience working on advanced level tree assessments for the municipality of Singapore and now with the Central Park Conservancy in New York City. She shares her experience using the resistograph and tomograph – the two industrial techniques and equipment in advanced level tree assessment, including basic concepts on how these diagnostic tools work, their benefits and value to tree risk assessor and discusses possible technological advancements or developments in arboricultural advanced diagnostics.

1:00–2:00 p.m.

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1:00–2:00 p.m.

Designing Resilient Communities with Trees: The Green Neighborhood Program

--Ryan Allen, Spenser Balog, and Jessica Sanders

This session will explore how trees provide ecological services that generate a return on the investment a city makes toward growing a healthy and robust tree canopy. From a citywide level, we will discuss how to create a city resilient to climate change, focusing on disadvantaged communities that are more vulnerable to pollution hazards and how to effectively guide management planning efforts at the project and community scale. Using project examples, including the Green Neighborhood Program, we will demonstrate how developing equitable tree canopy cover begins in the initial planning phases, and highlight real tools to use in planning efforts.

2:00–2:30 p.m.

The Meaning of Tree Biomechanics To Tree Health Care Providers

--Kim Coder

Review of the last decade of research. Coverage will include tree sail, height, size issues, and their impact resisting applied wind and gravity loads. Arboricultural solutions gleaned from biochemical research will be presented with minimal math and targeted at field applications.

2:00–2:35 p.m.

Woody Plant Biodiversity Explains Arthropod Management Interventions in Residential Landscapes

--Chris Riley

Residential landscapes are infrequently designed with principles of sustainability in mind, resulting in the extensive use of pesticides to suppress a diverse array of plant pests. In this study, we ask whether ecological theory can inform the sustainable design and management of woody

plant communities on urban residential properties. We used a multi-year plant health care program dataset to examine at the residual property scale the relationships between woody plant biodiversity and the percentage of plants that were native and pest management interventions, a metric of direct relevance to residents and plant health care practitioners. We found that the number of pest management interventions targeting phytophagous arthropods, but not plant pathogens, was negatively related to woody plant biodiversity. Given these findings, efforts to increase woody plant biodiversity in residential landscapes could result in increased phytophagous arthropod pest suppression, thereby diminishing the need for pesticide applications and their associated adverse effects.

2:30–4:30 p.m.

Urban Tree Growth Business Meeting

--Beatra Wilson, Darrell K. Street, Ph.D. and Yael Franco

The presentation discusses an i-Tree Eco project results, findings and conclusion where it summarizes the structure, function and value of the urban forest ecosystem for the city of Zachary, Louisiana, USA.

In the second hour we will conduct our business topics including our new executive committee, our relationship with AREA (Arboriculture Research and Education Academy), and membership input.

4:30–5:00 p.m.

ISA 2021 International Virtual Conference Closing Session

Join ISA for a recap of the conference and hear exciting announcements from ISA's CEO and Executive Director.

5:00–5:05 p.m.

ISA 2022 International Conference Promotional Video

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MONDAY 13 DECEMBER

10:00–10:30 a.m.

The Science of Saw Chain

--Mattias Karlsson and Jakob Lagerwall

Why do different saw chain tooth types exist? What's the difference? We'll discuss the history and geometry of chainsaw chains and how this impacts cutting capacity. We'll also review the need for maintenance and filing and why it also can impact your ability to cut effectively.

10:45- 11:20 a.m.

Knucklebooms and Cranes

--Mark Moeske

Knucklebooms are cranes. This presentation will go through what you need to know to safely work with all cranes within the tree care industry.

11:30 a.m.–12:10 p.m.

The Importance of Arboriculture Trade Schools

--David Vincent

With the push for sending students to college as high as ever, recruiting and training for skilled trades is becoming more important. ISA Michigan has been working to construct a 10-day pilot program with a grant from the DNR. This pilot program pulls highly skilled arborist trainers together to teach entry level students the skilled trade of arboriculture. After completion of this course, the students are certified in four TCIA Tree Care Academy programs and have spent 80 hours receiving hands on training running chainsaws, chippers and aerial lifts while climbing trees and learning proper pruning techniques.

12:15–12:45 p.m.

Contract Climbers: An Untapped Training Resource

--Craig Bachmann

The profession of arboriculture continues to struggle with a lack of training that results in injuries, fatalities and property damage. This is particularly true for small companies that are not ready to hire a qualified crew supervisor. Professional contract climbers offer a unique solution to improve crew safety and productivity. Learn how a professional contract climber can help improve knowledge, skills and safety culture and your company.



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- ISA arboriculture research (AREA)
- Climbers' Corner and safety
- Legal and business issues
- Soils and water
- Tree pests and disease
- Tree risk assessment
- Urban forestry
- Diagnostics and plant health care
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- Presentations in Spanish
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- Funding for scientific research on urban tree care issues
- Funding for arboriculture education programs
- Scholarships for aspiring arborists

LIVE TREE Fund After Hours

Wednesday 15 December, 4:45–6:00 p.m.

Please join TREE Fund for a Virtual TREE Fund After Hours. TREE Fund will provide an update on their activities, award this year's Volunteer of the Year, recognize the success of this year's Tour des Trees riders and celebrate the importance of their mission with the help from a few friends.

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Thank You to Our ISA Committees

Thank you to all of our committee members and volunteers who served and continue to serve in important leadership roles with ISA. Their efforts and dedication to ISA and our industry are inspiring and vital to the continued growth of our organization.

Thank you to our 2020-2021 Board of Directors

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Tom Smiley, Ph.D

Christopher Boza
Janine Lester

Sharon Jean-Philippe
Samuel Ma
Shirley Vaughn

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