

# Making a Difference

## 2020 Texas A&M Greenhouse and Nursery Webinar Series

Dr. Erfan Vafaie – Extension Program Specialist-II, Greenhouse and Nursery IPM

### Relevance

Greenhouse and Nursery comprised a \$1.3 billion industry in Texas in 2017, employing thousands of full-time and part-time employees. The initial impetus of this program was to establish better relationship between Texas growers and the Texas Department of Agriculture and increase compliance with pesticide application regulations. This annual program features a speaker from Texas Department of Agriculture, speaking specifically to common non-compliance issues found in greenhouse and nursery settings. Other speakers are invited to provide recent research and content that is specifically tailored to professional horticultural producers.

### Response

*Main Purpose:* Provide educational programming for greenhouse and nursery growers in best management practices, how to stay compliant with current and future pesticide regulations, worker protection standards, and increase adoption of integrated pest management practices.

Due to COVID-19 related restrictions on in-person programming, this year's program was delivered as a webinar series, delivered daily at 12:30 pm over two separate weeks in December of 2020. Number of attendees, pesticide applicator CEUs offered, and impact surveys (provided as a Qualtrics survey at the end of each webinar) are summarized for each webinar.

### Results

#### Overall

*Total Pesticide Applicator CEUs offered: 5 IPM, 1 General, 1 Laws & Regulations = 7 total*

*Cumulative potential economic impact<sup>1</sup>: \$1,783,500*

*Cumulative attendees<sup>2</sup>: 354*

*Cumulative employees represented<sup>3</sup>: 5,088 full-time, 607 part-time*

*Cumulative feedback on whether attendees found the program useful: 115 / 119 Yes (96.7%)*

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#### A systems approach to nursery certification

*Dr. Wayne Dixon, SANC Program Assistant, National Plant Board*

*December 1<sup>st</sup>, 2020*

- Pesticide applicator CEUs offered: 1 IPM
- Survey respondents/Attendees: 13/22, 59.0 % response rate
- Potential economic impact of webinar on business of attendees: \$241,000
- \$41,094,000 in annual project sales for 2020, 334 full-time, and 139 part-time employees represented

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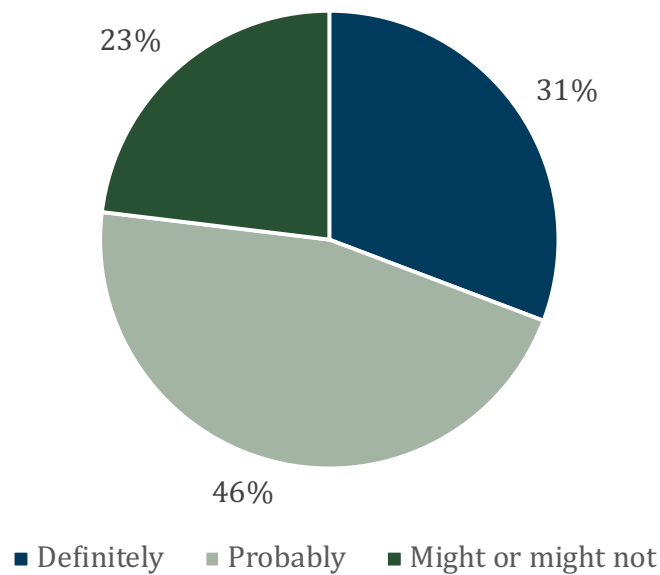
<sup>1</sup> Represents the total of the economic impact recorded for separate program surveys that attendees self-reported

<sup>2</sup> Includes duplicated attendees over each webinar (i.e. Joe Smith attending each of the 7 webinars counts as 7)

<sup>3</sup> Likely includes duplications due to individuals reporting employee counts separately for each webinar they attended.

*Educational programs of the Texas A&M AgriLife Extension Service are open to all people without regard to race, color, sex, religion, national origin, age, disability, genetic information, or veteran status. The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Courts of Texas Cooperating*

- When asked about plans as a result of this program, respondents ranked the following from 1 – 5, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Neither agree nor disagree”, 4 = “Agree”, and 5 = “Strongly Agree” (13 respondents) (mean ± standard deviation):
  - Consider enrolling in SANC: Neither agree nor disagree-to-Agree (3.5 ± 0.8)
  - Formalize efforts to manage pests and diseases: Agree-to-Strongly Agree (4.5 ± 0.5)
  - Look for products from SANC certified facilities: Agree-to-Strongly Agree (4.5 ± 0.5)
- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (13 respondents) (mean ± standard deviation):
  - Understanding of SANC: Increased some-to-a lot (3.8 ± 0.6)
  - Understanding of critical control points: Increased some-to-a lot (3.5 ± 0.8)
  - Confidence in implementing a pest management plan: Increased some-to-a lot (3.3 ± 0.6)
- When asked “Do you plan on using the information you learned today?”, attendees responded:



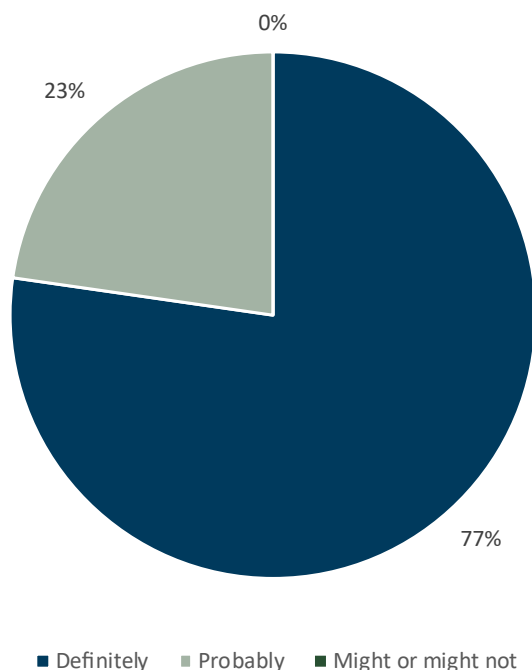

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### **Pesticide regulatory compliance and import/export inspections**

*Katherine Newton, Pesticide Inspector, Texas Department of Agriculture  
December 2<sup>nd</sup>, 2020*

- Pesticide applicator CEUs offered: 1 Laws & Regulations
- Survey respondents/Attendees: 22/48, 45.8% response rate
- Potential economic impact of webinar on business of attendees: \$323,000
- \$50,855,000 in annual project sales for 2020, 921 full-time, and 139 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from 1 – 7, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (22 respondents) (mean ± standard deviation):
  - Keep better pesticide applicator records: Agree-to-Strongly agree (6.0 ± 1.0)
  - Increase compliance with TDA regulations: Agree-to-Strongly agree (6.1 ± 1.0)
  - Update my WPS signage: Somewhat agree-to-Agree (5.7 ± 1.5)

- Take advantage of pesticide disposal programs: Agree-to-Strongly agree ( $6.5 \pm 0.7$ )
- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (22 respondents) (mean  $\pm$  standard deviation):
  - Understanding of pesticide regulatory compliance: Increased a little-to-some ( $2.7 \pm 0.8$ )
  - Ability to keep pesticide records: Increased a little-to-some ( $2.8 \pm 0.9$ )
  - Follow WPS regulations: Increased a little-to-some ( $2.8 \pm 0.9$ )
  - Understanding of common TDA non-compliance issues: Increase some ( $3.0 \pm 0.8$ )
- When asked “Do you plan on using the information you learned today?”, attendees responded:



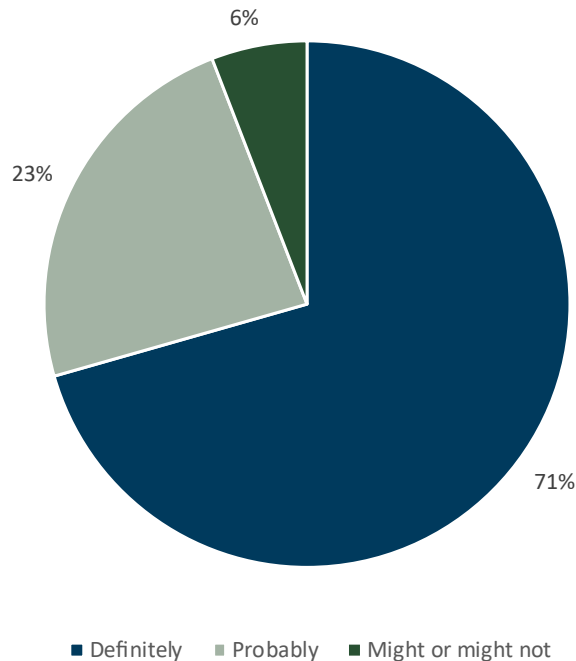

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### **Integrating natural enemies for pest suppression in protected culture**

*Suzanne Wainwright, Buglady Consulting  
December 4<sup>th</sup>, 2020*

- Pesticide applicator CEUs offered: 1 IPM
- Survey respondents/Attendees: 17/44, 38.6% response rate
- Potential economic impact of webinar on business of attendees: \$451,500
- \$101,048,998 in annual project sales for 2020, 701 full-time, and 44 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from 1 – 7, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (17 respondents) (mean  $\pm$  standard deviation):
  - Decrease insecticide use: Somewhat agree-to-agree ( $5.3 \pm 1.4$ )
  - Modify insecticides to decrease impact on beneficial insects: Somewhat agree-to-agree ( $5.3 \pm 1.3$ )
  - Investigate using natural enemies in my operation: Agree-to-Strongly agree ( $6.1 \pm 0.9$ )
  - Release or conserve natural enemies: Somewhat agree-to-agree ( $5.9 \pm 0.9$ )

- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (17 respondents) (mean ± standard deviation):
  - Understanding of pest ID resources: increased some-to-a lot (3.4 ± 0.6)
  - Ability to determine how safe insecticides are for beneficials: increased some-to-a lot (3.3 ± 0.9)
  - Confidence in implementing biological control: increased some-to-a lot (3.1 ± 0.8)
  - Understanding of limitations of biological control: increased some-to-a lot (3.1 ± 0.7)
- When asked “Do you plan on using the information you learned today?”, attendees responded:

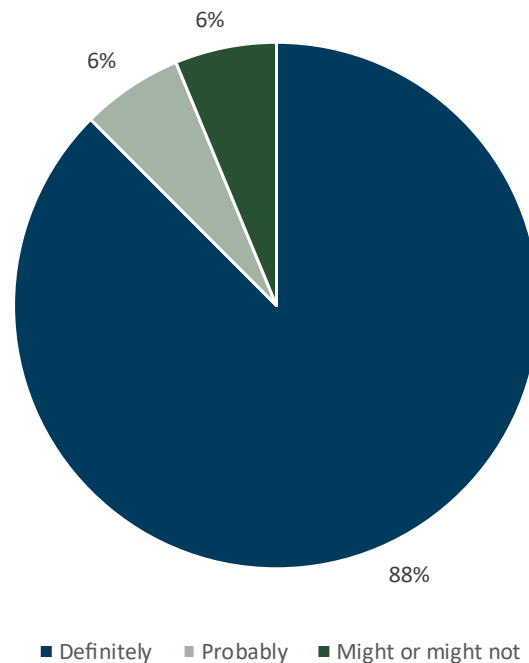


### Integrated disease management of insects in nursery production

Dr. Ann Chase, Chase Agricultural Consulting  
December 15<sup>th</sup>, 2020

- Pesticide applicator CEUs offered: 1 IPM
- Survey respondents/Attendees: 16/38, 42.1% response rate
- Potential economic impact of webinar on business of attendees: \$481,500
- \$43,530,999 in annual project sales for 2020, 805 full-time, and 128 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from 1 – 7, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (16 respondents) (mean ± standard deviation):
  - Adopt sanitation practices: Agree-to-Strongly agree (6.6 ± 0.7)
  - Sanitize growing surfaces: Agree-to-Strongly agree (6.3 ± 0.8)
  - Increase use of preventative practices: Agree-to-Strongly agree (6.5 ± 0.5)
  - Consider dipping cuttings to prevent plant pathogens or improve rooting: Agree-to-Strongly agree (6.3 ± 0.6)

- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (16 respondents) (mean ± standard deviation):
  - Confidence in preventing plant pathogens: Increased some-to-a lot (3.5 ± 0.7)
  - Confidence in cleaning benches: Increased some-to-a lot (3.5 ± 0.6)
  - Understanding of plant pathogens in propagation: Increased some-to-a lot (3.5 ± 0.7)
- When asked “Do you plan on using the information you learned today?”, attendees responded:



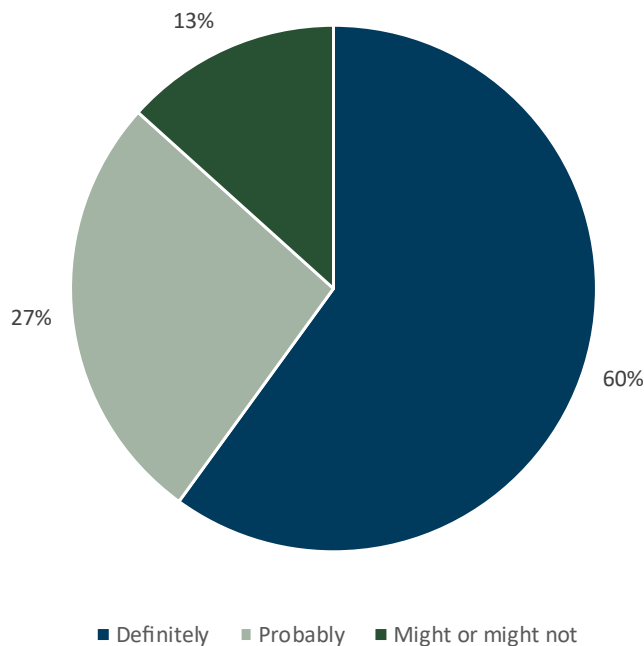

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### Integrated pest management of insects in nursery production

*Dr. Juang-Horng Chong (JC), Professor & Extension Specialist, Clemson University  
December 16<sup>th</sup>, 2020*

- Pesticide applicator CEUs offered: 1 IPM
- Survey respondents/Attendees: 15/39, 38.5% response rate
- Potential economic impact of webinar on business of attendees: \$61,500
- \$44,049,999 in annual project sales for 2020, 770 full-time, and 109 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from 1 – 7, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (15 respondents) (mean ± standard deviation):
  - Identify tree pests early: Agree-to-Strongly agree (6.1 ± 1.0)
  - Reduce applications of broad-spectrum insecticides: Somewhat agree-to-Agree (5.8 ± 1.3)
  - Trap pine and ambrosia beetles: Somewhat agree-to-Agree 95.4 ± 1.5)
- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (15 respondents) (mean ± standard deviation):
  - Understanding of galls: Increased some-to-a lot (3.3 ± 0.8)
  - Understanding of pine beetles: Increased some-to-a lot (3.1 ± 0.9)

- Ability to identify ambrosia beetle damage: Increased some-to-a lot ( $3.1 \pm 0.9$ )
- Confidence in preventative control of ambrosia beetles: Increased some-to-a lot ( $3.2 \pm 0.9$ )
- Ability to identify red-headed flea beetles and their damage: Increased some-to-a lot ( $3.3 \pm 1.0$ )
- When asked “Do you plan on using the information you learned today?”, attendees responded:

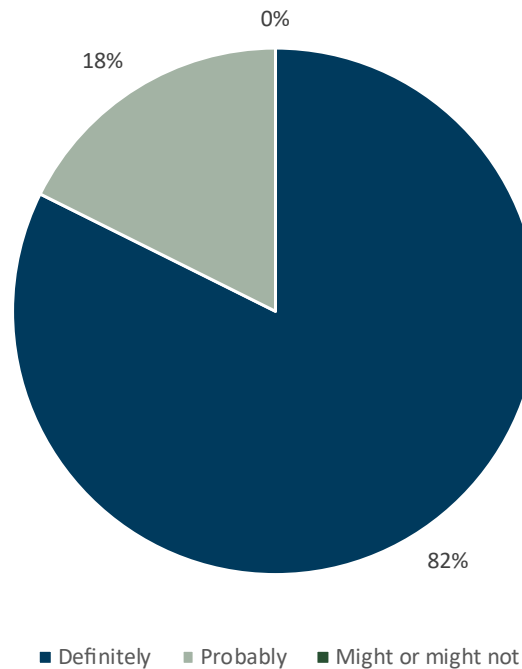


## Pesticide Hazards and Safety

*Dr. Mark Matocha, Associate Professor and Extension Specialist, Texas A&M AgriLife Extension Service  
December 17<sup>th</sup>, 2020*

- Pesticide applicator CEUs offered: 1 General
- Survey respondents/Attendees: 17/73, 23.3% response rate
- Potential economic impact of webinar on business of attendees: \$122,000
- \$1,365,999 in annual project sales for 2020, 1,013 full-time, and 35 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from 1 – 7, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (17 respondents) (mean  $\pm$  standard deviation):
  - Dilate my eyes with Solanaceae extracts (negative response test): Somewhat disagree-to-Neither agree nor disagree ( $3.2 \pm 2.6$ )
  - Increase pesticide safety practices: Agree-to-Strongly agree ( $6.4 \pm 0.6$ )
  - Ensure proper personal protective equipment use by pesticide applicators: Agree-to-Strongly agree ( $6.4 \pm 0.7$ )
  - Provide access to gloves for pesticide handlers: Agree-to-Strongly agree ( $6.4 \pm 0.7$ )
  - Prevent backflow of pesticides into water supply: Agree-to-Strongly agree ( $6.5 \pm 0.7$ )

- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (17 respondents) (mean ± standard deviation):
  - Understanding of pesticide toxicity: Increased some (3.0 ± 0.7)
  - Understanding of the importance of dosage in how poisonous a substance is: increased a little-to-some (2.9 ± 0.7)
  - Understanding of routes of pesticide exposure: increased a little-to-some (2.8 ± 0.7)
  - Ability to practice good PPE and pesticide storage practices: increased a little-to-some (2.9 ± 0.8)
  - Understanding of how to properly dispose of pesticide containers: increased a little-to-some (2.9 ± 0.7)
- When asked “Do you plan on using the information you learned today?”, attendees responded:



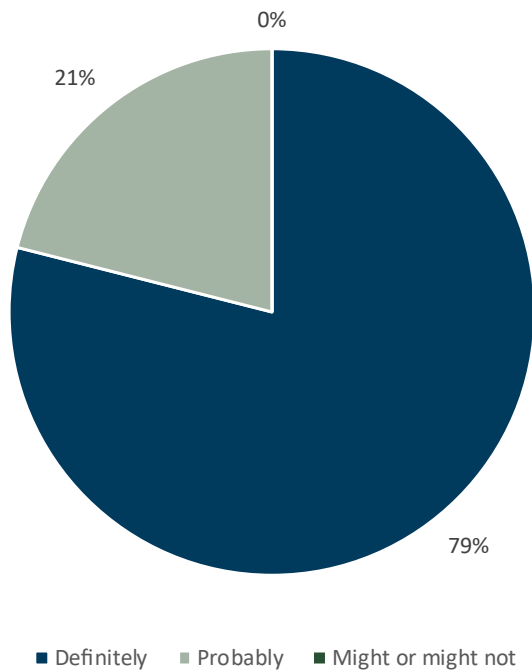

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### Recent advances in greenhouse and nursery integrated pest management

*Dr. Erfan Vafaie, Extension Program Specialist II, Texas A&M AgriLife Extension Service  
December 18<sup>th</sup>, 2020*

- Pesticide applicator CEUs offered: 1 IPM
- Survey respondents/Attendees: 19/46, 41.3% response rate
- Potential economic impact of webinar on business of attendees: \$103,000
- \$2,047,998 in annual project sales for 2020, 554 full-time, and 13 part-time employees represented
- When asked about plans as a result of this program, respondents ranked the following from **1 – 7**, where 1 = “Strongly disagree”, 2 = “Disagree”, 3 = “Somewhat disagree”, 4 = “Neither agree nor disagree”, and 5 = “Somewhat agree”, 6 = “Agree”, and 7 = “Strongly agree” (19 respondents) (mean ± standard deviation):
  - Adopt a new monitoring tool or method: Agree-to-strongly agree (6.3 ± 0.7)
  - Consider the use of biological control: Somewhat agree-to-Agree (5.9 ± 1.0)
  - Add a new insecticide in my rotation for pest management: Agree (6.0 ± 1.1)
  - Increase pesticide safety practices: Somewhat agree-to-Agree (5.8 ± 1.0)

- When asked how they felt as a result of the program, respondents ranked the following from 1 – 4, where 1 = “has not increased”, 2 = “has increased a little”, 3 = “has increased some”, and 4 = “has increased a lot” (19 respondents) (mean ± standard deviation):
  - Confidence in thrips identification: Increased a little-to-some (2.7 ± 0.7)
  - Confidence in whitefly management: increased some-to-a lot (3.0 ± 0.8)
  - Confidence in aphid management: increased some-to-a lot (3.0 ± 0.8)
- When asked “Do you plan on using the information you learned today?”, attendees responded:




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**Select feedback/comments from attendees from different webinar sessions:**

- “I own a small nursery operation. This info is excellent as it provides an outline of how to identify best practices, how to follow them, how to document for audit purposes, etc. It will certainly improve my daily business operations & practices. Thank you.”
- “I come from a healthcare background and this is exactly what I used to do in terms of quality improvement and best practices. This makes me so happy that I can integrate the same methodology into my operation!”
- “I only disagreed to the first questions because I have been complying with TDA. KATHERINE’s the best!”
- “I like the online webinar. It helps with being able to use time more effectively vs spending 4 hours on the road just getting back and forth to the meeting. I also like it being broke down on different days. Thanks.”
- “Very informational. Great presentation & she is very experienced. Great speaker”
- “Suzanne is so knowledgeable and relatable. Always fun to listen to her.”
- “The program was very well presented. A lot of good information.”
- “Great info that will help with our less-toxic pest management strategies in our small “Mom & Pop” nursery where we grow African violets & gesneriads.”
- “A very good program, available to more people, very good because of Pandemic”
- “Love the webinar format instead of having to physically attend a meeting”
- “I am the director of a campus greenhouse. I intend to have my staff watch the video recording of this seminar to get a better understanding of why cultural practices are important to greenhouse management. I also intend to purchase some of the products discussed to increase greenhouse sanitation. This was great, thank you so much!”
- “Dr. Chase Thank you for a very informative talk . Excellent presentation. Excellent slides. A must see for my propagation team!”
- “Work for BioWorks, but share rec’s with growers when talking to them. Ann is always a great source for info, and rec’s.”



- “Excellent topic- more in depth than the usual CEU classes”
  - “Another great program. Good pace. Great review of important topic.”
  - “This was the first that I could catch this year but I'll watch all of the recordings. The content was not only informative to me as someone less experienced in horticulture/agriculture but their material was based on scientific-based findings and relevant to TX unlike the general internet frou frou and hearsay. The speakers had a great pace and good graphics and made slides that are standalone. I actually have so many questions but held back since I'm pretty sure they've been address in earlier webinars. This was better than the presentations I've sat in on in the West Texas Ag Extension office (where I currently live) to be honest where the information is usually generic and the speaker has no firsthand experience with the technique or application or has never done experiments.”
  - “Thank you, Erfan! I accidentally stumbled upon this series, and have found this specific talk very insightful at life cycles of pests and products/biologicals that are effective at treating them.”
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## Summary

More than \$1.7M is potential economic impact was reported by attendees as a direct result of this webinar series from a cumulative 354 attendees over 7 webinars. The majority of attendees “definitely” planned on using information they learned from the webinars (85 / 119 = 71.4%) and found the program useful (115 / 119 = 96.7%). As a result of this webinar series, respondents increased some-to-a lot in their understanding of SANC, common TDA non-compliance issues, plant pathogens in propagation, pesticide toxicity, confidence in implementing biological control, implementing a pest management plan, preventing plant pathogens, preventative control of ambrosia beetles, and whitefly management on average. On average, as a result of this webinar series, respondents also agreed-to-strongly agreed to formalize efforts to manage pests and diseases, increase compliance with TDA regulations, investigate using natural enemies in their operation, adopt sanitation practices, identify tree pests early, ensure proper personal protective equipment use by pesticide applicators, and adopt a new monitoring tool or method. Based on the topics presented, the high-impact attendees representing in the greenhouse and nursery industry, and results of the surveys, this webinar series was a success in increasing potential adoption of IPM practices and compliance with TDA regulations by the greenhouse and nursery industry in Texas.

## Acknowledgements

The Greenhouse and Nursery IPM Program Specialist steering committee, for providing input on program topics and timing. Program speakers, program co-sponsor (TNLA), and speaker sponsors (BioWorks, BASF, Syngenta, Beneficial Insectary, OHP, and Pace49).

## References

1. Texas Department of Agriculture. Texas Ag Stats. Retrieved on January 14, 2021 from: <https://www.texasagriculture.gov/About/TexasAgStats.aspx>