

NAASC's novel approaches for ICAR 2021, with accompanying mean survey scores from attendees (N=379 respondents of ~1000 attendees)

1. inclusion of 36 community-proposed and led mini-symposia (score: 3.40),
2. selecting invited plenary and keynote speakers, including through community nomination, that hadn't recently been featured (score: 3.35),
3. developing new plenary session topics around bigger mechanistic themes; a balance of fundamental discoveries with work that showcases applied research; and a focus on the broad set of tools of high utility available for Arabidopsis that enable translation to important crop species (score: 3.23),
4. diversifying speakers in sessions and engaging non-traditional speakers including the prioritization of balanced demographics in speakers (gender and career stage, score: 3.37),
5. dramatically increasing the number of opportunities for participants to present their work (score: 3.29),
6. discussion sessions during concurrent symposia (score: 3.11).

DETAILS OF APPROACHES

Novel approach #1: the top rated new approach was inclusion of community-proposed and led mini-symposia.

- Organizers held a community competition and received nearly 100 applications for 36 slots; the solicitation encouraged diverse applications by gender, career stage, institution, and geographic location.
- The variety of proposals was extensive and resulted in the most diverse program in ICAR history, with respect to topics and speaker demographics (gender, career stage).
- Example comments on community sessions: "The topics were exciting and diverse. Sometimes the sessions are a bit samey-samey from year to year, so it was a joy to hear about totally new systems, approaches, and topics." "Liked the breadth of topics covered and provided a good opportunity for people to speak." "This was the most amazing thing. It made the conference a real community initiative." This new approach was so widely-liked and successful that the organizers for ICAR 2022 have adopted it in their programming.

Novel approach #2 involved a variety of new ways to select the 23 invited speakers to ensure that new voices and science topics were featured.

- NAASC decided to exclude from consideration any plenary or keynote speakers that had been featured at ICAR or ASPB annual meetings over the previous 5 years.
- Speaker ideas were gathered via community surveys, input from an external advisory board, looking at the DiversifyPlantSci online database, and by surveying recent plant biology publications.

Novel approach #3: First, we developed a speaker list of those we would like to have speak, regardless of topic, and once confirmed, we grouped them into sessions.

- Our rationale for this approach was multifold: it puts emphasis on finding speakers that the audience is really excited to hear, because they have a new breakthrough to present. Sometimes these breakthroughs are so new, they will not fit into a preconceived "theme".

ICAR 2020/2021-Virtual was organized by the North American Arabidopsis Steering Committee (NAASC)

- It enabled us to address our diversity, equity and inclusion objectives, because we could manage this up front at a global level. We could devise creative and integrated session themes that will be more of a draw, rather than a narrower focus. The result was a novel and exciting program.

Novel approach #4, the survey's second highest rated approach, was our focus on career stage and gender balance and diversity of speakers and session organizers.

- We included a separate selection process for proposals submitted by students and postdoctoral scholars to fill a pre-set minimum of 25% of chair slots. Ultimately, the 59 session chairs were comprised of 32% students or postdocs, 32% junior (pre-tenure) faculty, 31% post-tenure faculty, and 5% other; and 64% of session chairs identified as women.

Novel approach #5 was based on many years of community survey input that showed opportunities to present one's work is a top priority for ICAR.

- ICAR 2021 featured more than 300 speakers, a nearly 2.5-fold increase compared to the last US-based ICAR in 2017 that featured 122 speakers.
- Furthermore, ICAR 2021 provided significantly more leadership opportunities for the community: 92% of speakers were invited by the community in 2021 compared to 62% in 2017 were community.
- There was a trade-off of course, to having many more speakers, and that was the necessity to choose which talks to attend. One benefit of the virtual format was that the organizers had all talks recorded; the recordings were posted 1 week prior to the conference and were accessible to attendees for 6 weeks following.
- Example comments: "I enjoyed seeing a wide range of speakers, including graduate students and post-doctoral fellows." "It was a bit overwhelming, too many to choose from. Being able to watch for a month afterwards helps." "I liked hearing many things, and having a chance to follow up on the snippets by chats or by looking up papers (and sometimes rewatching)."

Finally, novel approach #6 was added as the organizers brainstormed creative ways to maintain interactivity upon pivoting to a virtual setting. The intent was to enable greater community discussions by reserving 20-25 minutes of each mini-symposium for session chair-led discussion sessions.

- Survey respondents gave this approach a score of 3.11, indicating that the discussions were generally appreciated and scored as "worked well (3)".
- Virtual discussions were expected to be more difficult than when done in-person due to technical and time-zone challenges.
- Organizers also enabled additional 1-hour small group discussions for any session members that wanted to continue following the scheduled session time.
- Comments included "This really depends on the chair of the session and whether they pay attention to who is getting asked questions to ensure each speaker gets a chance to talk." "I wish the group discussion was more interactive, rather than just reading and answering questions from the chat. The "room" discussion after the session was quite useful and some lasted one hour!" "I like standard Q&A much more. Questions for a speaker are much more fresh right after a talk. Also, several speakers received no questions but would have if they had their own question period." "When this worked well, it was great. I loved hearing the speakers talk with one another and 'riff' off each other's thoughts." "The virtual discussions

ICAR 2020/2021-Virtual was organized by the North American Arabidopsis Steering Committee (NAASC)

were really well done in this setting. In a live venue I do prefer having questions after each talk."

Outcomes

The ICAR 2021 organizers (NAASC) developed novel programming approaches to promote early-career scientists and community leadership; the result was the most diverse program in ICAR history. With 23 of the 300+ speakers invited by the organizers, the program prioritized community proposed/led sessions and speakers and devoted 92% of the program to community-proposed sessions which featured students, postdocs and junior (pre-tenure) faculty in 67% of the speaking slots. Gender parity was achieved in the 300+ platform speakers for invited speakers (52% women), community mini-symposium chairs (59% women) and community session speakers (52% women). The community response to our novel approaches was overwhelmingly positive. Novel approach #4, the survey's second highest rated approach, was our focus on career stage and gender balance and diversity of speakers and session organizers. We included a separate selection process for proposals submitted by students and postdoctoral scholars to fill a pre-set minimum of 25% of chair slots. Ultimately, the 59 session chairs were comprised of 32% students or postdocs, 32% junior (pre-tenure) faculty, 31% post-tenure faculty, and 5% other; and 64% of session chairs identified as women. A minority of respondents did not appreciate, or agree with, the focus on diversity by gender or career stage; these comments could be summarized as "one should focus on the science and not any personal attribute." When the demographics of ICAR participants were compared to those given a platform to speak, we saw that there was equal representation by reported gender: Women: 51%:52% attendees: speakers; Men: 44%:44% attendees: speakers; Decline to state: 5%:3% attendees: speakers, Non-binary/gender queer: 1%:1% attendees: speakers.

However, while there was greater representation by early career speakers than at a typical ICAR, early-career speakers remained under-represented compared to their attendance levels: Career stage: Students & Postdocs: 56%:40% attendees: speakers; Faculty: 36%:53% attendees: speakers (Jr. Faculty: 13%:27%, Sr. Faculty: 23%:26%), Other title: 7%:8% attendees: speakers. Example comments: "Very varied, and very often interesting to people from different backgrounds. It was nice to give the power to the community." "Great, I appreciate the effort that went into bringing in diverse speakers." "That's the way it should be [referring to gender parity]." "I like the fact that you focused on career stage, especially for young researchers and ECR, in order to increase their visibility and create the opportunity to extend their professional network."

A demographic that continues to show imbalance is racial and ethnic diversity of conference attendees, which likely reflects the make-up of the plant science community at large. Attendees self-reported racial/ethnic status across nearly 40 categories; when grouped to 7 major categories this became: 49% (included White in some aspect); 32% (included Asian in some aspect); 9% (preferred not to answer), 6% (included Hispanic or Latinx in some aspect), 4% (included Black or African, in some aspect), 0.5% (wrote in multiple categories), 0.3% (wrote in a new, single category).

There is clearly more effort and focus needed to enable equal participation and leadership in the plant sciences.