

## **Questions Farmers Ask: Implications for Improving Information Resources for Farmer Audiences**

### **Abstract**

eOrganic, the Organic Agriculture Community of eXtension, has conducted webinars on organic farming research for over a decade. I examined questions asked by farmers and university researchers or educators during 52 webinars presented 2015–2017. A higher proportion of questions asked by farmers than questions asked by researchers/educators were about risks, benefits, and problem solving, and the farmers' questions contained many innovative ideas about production. A higher proportion of researcher/educator questions than farmer questions related to details of research studies, though farmers also posed questions about research methods. This article contains suggestions about tailoring research presentations to farmer audiences and confirms the mutual benefits of collaborations between farmers and researchers.

**Keywords:** [webinars](#), [presentations](#), [farmers](#), [researchers](#), [communication](#)

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## **Introduction**

How can researchers make better presentations and create better information resources for farmer audiences? Since 2009, eOrganic, which is the Organic Agriculture Community of eXtension, has conducted free, publicly available webinars on organic farming research for over 27,000 participants, including farmers, university researchers or educators, Extension agents, organic inspectors and certifiers, industry professionals, nonprofit staff, and others. Many of the webinars describe results of U.S. Department of Agriculture (USDA) National Organic Program, Organic Research and Extension Initiative, or Organic Transitions projects. During the webinars, attendees type in questions, which presenters read aloud and answer. Researchers who have presented webinars often comment on the advanced level of farmer questions and their usefulness for shaping further research. As organizer and moderator of the webinars, I often familiarize presenters with potential pitfalls that can result in poor evaluations by attendees, such as using excessive scientific jargon and complicated graphs, giving long descriptions of research methodology and results without practical recommendations, or being unfamiliar with relevant organic certification regulations. Having amassed many

webinar attendance reports that include all the attendees' typed questions, I wondered whether a close examination of the types of questions farmers ask, and how they differ from the questions university researchers or educators ask, might provide additional insights that could help those who present research tailor written materials and presentations to farmer audiences.

## Literature Review

Although there are many Extension agents who conduct research, not all researchers who deliver information to farmer audiences have experience working with farmers, so they may not be familiar with the needs of farmer audiences or, specifically, organic farmer audiences.

Some researchers have investigated farmer audiences and characterized their information needs. Stevens and Andrews (2006) described farmers as "averse to additional risk" (e.g., p. 97), and they found that farmers value lifelong learning; prefer learning about proven, current, relevant, and applicable methods; and enjoy learning from other farmers. Franz, Piercy, Donaldson, Richard, and Westbrook (2010) found that farmers value research-based knowledge that is current and relevant to their local areas and that they want to learn how to save time and money, assess economic feasibility of new practices, apply research information, and build relationships with other farmers. Wilner (2013) recommended learning about farmers' prior knowledge and interests before presenting them with information, focusing on the usefulness of information, and providing opportunities for information sharing.

Others have studied characteristics of organic farmers specifically. Agunga and Idogan (2007) noted that organic and sustainable farmers wanted information on how to overcome barriers related to organic certification as well as marketing, production, and environmental information. Muhammed, Isikhuemhen, and Basarir (2009) found that "alternative" farmers valued cost-benefit, risk management, and marketing information. Klonsky (2010) emphasized that organic farmers now have access to more production information but still face cost and regulatory barriers, necessitating clear information on organic regulations. Stephenson, Gwin, Powell, and Garrett (2012) compared priorities of organic farmers to those of researchers and found farmers to be more concerned than researchers about market challenges and competition and the complexity and costs of regulatory compliance. The study by Stephenson et al. (2012) as well as others that compared the mental models of farmers and researchers (Halbrendt et al., 2014; Jabbour, Zwickle, Gallandt, & McPhee, 2014) have shown that identifying areas of divergence between these groups proved valuable for pinpointing which additional areas researchers might explore in future research or which concepts they might reframe to better match farmers' interests, thereby improving communication and outreach.

A previous study of eOrganic webinar evaluation results revealed that participants were critical of presentations that described research without practical applications (Formiga, Stone, Heleba, McQueen, & Coe, 2014). Jerkins and Ory (2016) detailed specific production and marketing topics on which organic farmers need more research-based information, such as soil health and weed management, and emphasized the value and necessity of farmers as research participants. Based on the literature, I expected that farmer questions on webinars about organic farming research might relate to economic and environmental problem solving as well as marketing and regulatory issues.

## Methodology

I compiled webinar attendee reports from 52 webinars on a variety of organic farming research topics

presented from 2015 to 2017. These reports, generated by the GoToWebinar program, included the number of attendees, their primary occupations, and the questions typed by attendees during the presentations. Attendance for all the webinars included 1,701 farmers (29%) and 596 university researchers or educators (10%). Other attendees included 543 Extension agents (9%), 323 government agency employees (6%), 276 nonprofit staff members (5%), 179 organic inspectors or certifiers (3%), 808 agricultural professionals (14%), 1,333 others (students, home gardeners, etc.) (23%), and 43 participants who did not categorize their professions (1%). These numbers include people who attended more than one webinar to account for all questions asked by farmers and university researchers or educators during all webinars. Although the farmers who attended were likely interested in learning about organic production methods, they were not necessarily organic farmers. The attendee reports did not include information on the organic certification status of attendees' farms.

Researchers presented most of the webinars, although some webinars also included farmer collaborators. Topics for the webinars are listed in Table 1. Across all the webinars, there were 458 questions from farmers and university researchers or educators. Of those, 355 were from farmers, and 103 were from university researchers or educators. Table 1 shows the numbers of questions from farmers and university researchers or educators by webinar topic.

**Table 1.**

Numbers of Webinars, Farmer and University Researcher/Educator Attendees, and Questions Asked by Farmers and University Researchers/Educators by Topic

<b>Webinar topic</b>	<b>No. of webinars</b>	<b>No. of farmers</b>	<b>No. of university researchers/educators</b>	<b>No. of farmer questions</b>	<b>No. of university researcher/educator questions</b>
Plant breeding	4	88	55	9	8
Climate	2	51	18	4	3
Conservation	1	15	16	7	2
Dairy	6	84	28	22	4
Disease	5	182	54	50	10
Extension <sup>a</sup>	1	20	32	0	5
Food safety	2	73	17	18	1
Fruit and vegetables	1	43	9	3	3
Grain	3	128	39	25	5
Insects	8	382	126	64	20
Livestock	2	32	11	22	2
Mulch	1	161	36	42	8
Poultry	1	29	2	15	0
Research <sup>b</sup>	1	10	13	3	7

Seed production	11	301	107	47	18
Soil	1	32	10	7	1
Vegetables	1	29	6	12	1
Weeds	1	41	17	5	5
Totals	52	1701	596	355	103

<sup>a</sup>The Extension webinar was about approaches to organic Extension. <sup>b</sup>The research webinar was an analysis of U.S. Department of Agriculture organic research investments.

I gave the questions mutually exclusive numbered codes. Two categories—farm production questions (coded 1), which focused on what could be done on farms, and study questions (coded 5), which focused on the presenters' experiments—were too general, so I added second-level letter codes to each. I defined the codes more precisely during the coding process to ensure that each one signified something distinct from the others. I conducted the coding three times to ensure that the codes were consistent with the definitions. In Table 2, the codes are listed and defined, and example questions are provided.

**Table 2.**  
Codes for Categorizing Farmer and Researcher/Educator Questions

Code	Description	Example questions
1. Questions about farm production		
1A. Information request	General questions about how a producer can do something or how long a process takes or clarifying questions about farm production	<ul style="list-style-type: none"> <li>● What first steps should large growers take to grow their own seed?</li> <li>● How long does it take to achieve [cover crop] termination?</li> <li>● Is it possible to grow melons year-round?</li> </ul>
1B. Risks/benefits/problem solving on farm	Questions about how to solve a problem or improve something to do with production, why something is done, what the impact of something is, how to avoid a problem, or why a problem occurred	<ul style="list-style-type: none"> <li>● What is the best cover crop to use for dry farming beds?</li> <li>● Do you have any recommendations for dealing with bagrada bugs?</li> <li>● Does the benefit of retaining predators outweigh the risk of leaving so much worm habitat</li> </ul>

and food?

1C. Innovative idea for farm production

Questions that contain a suggestion for trying something new that was not mentioned in the webinar to solve a farm problem, such as a using different product, method, or tool

- What about timing crop plantings to avoid peak predation periods?
- What about using flowers that can be sold as a crop for insectaries, too?
- Instead of roller crimping, why not use a sickle bar to cut and lay it down in place?

1D. Applicability of production recommendations to something else

Questions about whether the recommended practice can work on a different crop or animal, be scaled up or down, or work in another region

- Are there any ways that a no-till system can be incorporated with direct seeded crops?
- Do you feel these principles will also apply to perennial crops, not just annuals?
- How would grazing management change with the much larger scale of commercial fields?

2. Questions about marketing

Questions about whether there is a market for something or how to improve marketing

- Is there much interest in contract growing native wildflower seeds?
- Are you aware of markets for emmer and/or einkorn?
- If I want to set up a seed contract, do I simply contact the seed company directly?

3. Questions about costs

Questions that are specifically about whether something is profitable, how much something costs, or whether incentives are available

- What are the savings to your farm?
- If there is no discernible improvement in milk production, how do you pay for the CV [Cow Vac] at \$7,500?
- If your loaf sells for \$4 how much

does your flour cost?

4. Questions about regulations

Questions about whether something is allowed or about rules such as organic certification or food safety rules

- Do I need to label produce sold out of a farm stand located on my farm?
- Don't the sources of rice and wheat bran need to be certified organic in order to use them for organic production of crops?
- Does a state organic certificate count?

5. Questions about the study

5A. Study information request

Questions about what was done, how something was done, or whether something was measured or a clarification request or request to see more data

- What size plots are you working with?
- At what point in the season were the perimeter crops mowed or tilled?
- Can you put units on all your figures to help [us] understand what you are trying to explain?

5B. Risks/benefits/problem solving in study

Questions about why something was done, what the cause was for a particular good or bad result, whether and how something was done to solve a problem, why something was important, what the impact of something was, whether something had a beneficial or detrimental effect, or why certain results occurred

- Did the grit harm the weed plastic around the tomatoes and peppers?
- Would the lack of fumigation be one of the reasons for smaller plants in the organic system?
- How are you controlling seed-borne disease?

5C. Innovative idea for study

Questions that contain a suggestion about something new to add to the study

- Have you tried the electric zapping walkthrough with fluorescent lighting?
- Did any of the farms try trap crops?

		<ul style="list-style-type: none"> <li>• Do you have plans for including polyculture cover crops in this study?</li> </ul>
5D. Applicability of study results to something else	Questions about whether the research can apply to a different crop, tool, animal, or farming system or can be scaled up or down	<ul style="list-style-type: none"> <li>• Can we expect the same results from hulled oats vs. naked oats?</li> <li>• Would the effect on clover be seen with other legumes also?</li> <li>• Can you hypothesize about milk production on a farm that is starting with a lot more (say 200 flies) per animal?</li> </ul>
6. Questions about biology	Questions about biology or ecology that are not about production practices or the research study	<ul style="list-style-type: none"> <li>• What keeps Brown Marmorated Stink Bug under control in Asia?</li> <li>• Is the soldier bug cannibalistic?</li> <li>• What beetle eats the potato beetle?</li> </ul>
7. Requests for other information	Questions about anything else that is not any of the above categories, including recommended resources, where to purchase something or find testing lab locations, organizations, policy, weather	<ul style="list-style-type: none"> <li>• Can you share sources of these seeds?</li> <li>• What is the average size of organic strawberry growers?</li> <li>• Can you give the link to documents on isolation distances for plants?</li> </ul>
8. Requests for collaboration	Questions about how to get involved or collaborate with other farmers, researchers, or organizations	<ul style="list-style-type: none"> <li>• How can a farm become involved in participatory trials?</li> <li>• How do I find and connect with bakers in my region?</li> <li>• Do you know of any dry farmers in the low desert in Arizona?</li> </ul>

## Results

Table 3 shows how many questions of each type farmers and university researchers/educators asked. It also shows the percentage of all questions asked by farmers and the percentage of all questions asked by researchers in each category. The percentages, which denote the proportion of questions in each category asked by each group, provide a better basis of comparison than the numbers of questions because there were many more farmers than researchers on the webinars and the total number of farmer questions was higher than the total number of researcher questions.

**Table 3.**

Numbers of Questions Related to Each Code Asked by Farmers and Researchers/Educators and Percentages of Farmer and Researcher/Educator Questions Related to Each Code

<b>Code no.</b>	<b>Code</b>	<b>No. of farmer questions</b>	<b>No. of university researcher/educator questions</b>	<b>Percentage of all farmer questions</b>	<b>Percentage of all university researcher/educator questions</b>
1A	Production information request	35	8	10%	8%
1B	Risks/benefits/problem solving on farm	93	22	26%	21%
1C	Innovative idea for farm production	31	4	9%	4%
1D	Applicability of production recommendations to something else	8	3	2%	3%
2	Marketing	7	4	2%	4%
3	Costs	6	1	2%	1%
4	Regulations	5	0	1%	0%
5A	Study information request	55	20	15%	19%
5B	Risks/benefits/problem solving in study	18	6	5%	6%
5C	Innovative idea for study	15	7	4%	7%
5D	Applicability of research to something else	8	0	2%	0%
6	Biology	21	7	6%	7%

7	Other information request	48	21	14%	20%
8	Collaboration request	5	0	1%	0%

For both groups, the highest number and percentage of questions related to farm production. Of these, the highest number and percentage of questions were about production risks, benefits, and problem solving. A slightly higher proportion of the farmer group's questions (10%) versus the researcher group's questions (8%) were general or clarifying questions about production (1A); similarly, 26% of farmer questions dealt with risks, benefits, and problem solving in production (1B) versus 21% of the researcher group's questions. Many of these questions from both groups concerned creating habitat for pollinators, balancing pest control with the need to promote beneficial insects, crop rotation, strategies for most effectively using organic inputs, seed production techniques, dairy production, equipment use, and soil and nutrient management. Nine percent of farmer questions versus 4% of researcher questions suggested innovative ideas for solving production problems; such questions addressed, for example, pest and disease control, equipment for cover crop termination, or incorporation of animals such as goats in a production system (1C). A slightly higher proportion of the researcher/educator questions (3%) than the farmer questions (2%) concerned whether the recommendations could apply to another crop or could be scaled up or down (1D).

There was a small number of specific questions about marketing, costs, and regulations overall. A slightly higher proportion of researchers/educators asked about marketing (4%, versus 2% for farmers). Farmers asked about markets for particular crops. Researchers/educators requested information about desirable vegetable traits or how to assist growers with volatile markets. One researcher asked about market opportunities for growers who increase climate resilience. Only six farmers and one researcher/educator asked questions specifically about costs. Just five farmers and no researchers/educators asked about regulations related to organic certification, food safety, or labeling.

Not surprisingly, a higher proportion of researcher/educator questions than farmer questions were about research studies (5A–5D), although there were many questions from farmers on this subject too. The proportion of researcher/educator questions was higher than that of farmer questions regarding details of study methodologies and measurements (5A): 19% versus 15%. Several study-related-information questions asked by farmers concerned their inability to understand graphs or abbreviations in charts shown by presenters. The two groups asked similar proportions of questions about risks, benefits, and problem solving in the studies (5B). A higher proportion of researcher/educator questions (7%) than farmer questions (4%) contained an innovative idea for the studies (5C); however, farmers also suggested ideas, such as using additional measurements and equipment or other pest control products. Only farmers asked about whether findings could be applied to other crops or scaled up or down (5D).

The topic of biology elicited similar percentages of questions from both groups, though the proportion was greater for researchers/educators. Many of these questions dealt with insect predation and diseases.

A higher proportion of researcher/educator questions were in the "other information request" category (20% for the researchers/educators versus 14% for farmers). These questions included requests for documents or books mentioned by presenters, requests for purchasing information, and other miscellaneous questions.

Only five farmers and no researchers/educators asked about collaboration. The farmers asked about how to

find research collaborators, bakers in their regions who would buy grain, or other producers interested in the same practices.

## Discussion

The many actively engaged farmers who attended the webinars and their questions about production and research indicate that many farmers are interested in learning about research-based information of potential benefit to their operations.

Attendees may have asked few specific questions about marketing, costs, and regulations because the webinar topics were primarily about production or research or because they may not have perceived the presenters as appropriate sources for answers to such questions. However, the results clearly show that attending farmers did not focus solely on costs but wanted to learn about effective organic production methods and gain the ecological and biological knowledge required to apply the methods.

The differences between farmer and university researcher/educator questions reflect the groups' differing immediate concerns and areas of expertise as well as their ability to imagine creative solutions within their respective lines of work. These differences are strengths, potentially mutually beneficial in collaborative or participatory research.

## Conclusion

The results of my study suggest some insights into how to tailor research presentations for farmer audiences:

- Understand that farmers want to know about risks, benefits, ways to solve problems, and ways to apply research to improve production and their livelihoods.
- Be aware of regulations that may affect how farmers can apply the information presented, such as organic certification rules, pesticide laws, and food safety regulations, to avoid making recommendations that could adversely affect farmers' ability to sell their products.
- Avoid jargon, and clearly label graphs and diagrams with familiar measuring units.
- Expect farmers to take an active interest in research and suggest other factors to consider, ways things might be done differently or better, different parameters to measure, or variations on the applicability of the research; however, avoid spending too much time discussing study methodology at the expense of production recommendations.
- If possible, use a registration form to ask participants about their particular interests related to the presentation topic.
- Provide links to further resources and opportunities for collaboration. If equipment or products are recommended, say where they can be obtained and their costs.
- Provide your contact information, and encourage participants to share information with each other during the presentation (by using the chat box during a webinar, for example).

- Finally, be prepared for good questions that can enrich and improve further research due to farmers' detailed knowledge and understanding of production practices and risks and ability to think of solutions.

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