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## **2021 Needs Assessment Findings: Northeast Organic Seed System (NOSS)**

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2021 Needs Assessment Findings

# NORTHEAST ORGANIC SEED SYSTEM (NOSS)

Megnot Mulugeta, Carina Isbell &  
Daniel Tobin



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## GLOSSARY

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**Commercial farmer:** Someone who oversees an operation where agricultural products are produced to be sold.

**Commercial seed producer:** Someone who oversees an operation where seeds and/or other planting material are produced to be sold, often through a contract with a seed company, though not exclusively.

**Community-based seed worker:** Someone who is involved in seed libraries, community gardens, and/or other small-scale initiatives designed to support communities and their local seed supply and distribution.

**Formal organic seed system:** The production, distribution, and management of organic seeds and other planting materials by the private (e.g., seed companies) and public (e.g., land-grant university) sectors scientifically bred for traits like distinctness, uniformity, and stability.

**Home-based seed worker:** Someone who is involved in growing crops for seeds (e.g., gardening, homesteading), saving seeds, and other seed activities at the household level.

**Informal organic seed system:** The production, distribution, and management of organic seeds and other planting materials by farmers, gardeners, community groups, and civil society institutions outside of the formal seed system, often with focus on diverse cultivars, heirloom and open-pollinated varieties, and other important characteristics not commonly found in the formal seed system.

**Northeast organic seed system (NOSS):** A term that loosely covers all organic seed activity within the U.S. states of Maryland, Delaware, New Jersey, Pennsylvania, Connecticut, Rhode Island, New York, Massachusetts, Vermont, New Hampshire, Maine, and bordering Canadian provinces of Quebec, Ontario, New Brunswick, and Nova Scotia.

**Organic seed:** Non-genetically modified seeds that have been harvested from plants grown in alignment with organic techniques, such as little to no use of synthetic pesticides, herbicides, and fertilizers, as well as the

implementation of practices such as no-till, crop rotations, cover cropping, etc., including seeds grown by growers without certification.

**Plant breeder:** Someone who purposefully cross-pollinates plants to develop cultivars with specific characteristics; can be affiliated (but not necessarily so) with universities, government institutions, seed companies, private research institutions, and non-profit groups, and includes those who are self- or communally- taught.

**Seed rematriation:** The return of seed varieties to communities that have historically stewarded them, often Indigenous communities, whose marginalization includes the extraction of culturally significant seeds from their communities.

## Funding

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## Acknowledgements

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This research could not have been possible without the support and collaboration of organizers and participants of the 2021 Northeast Organic Seed Conference (NOSC) and the Northeast Organic Farming Association-New York (NOFA-NY). We are deeply thankful for the dedication and energy of Heron Breen, Jacqueline Pilati and Hannah Traggis who deserve a special thanks for their efforts in designing and facilitating the needs assessment sessions and activities. We'd also like to extend our appreciation to the various researchers, producers, and seed workers who reviewed and provided feedback on the survey. And, finally, great thanks to the University of Vermont students who took notes during the 2021 NOSC.

## EXECUTIVE SUMMARY

Beginning in 2020, attendees and organizers of previous Northeast Organic Seed Conferences (NOSC) and researchers at the University of Vermont (UVM) embarked on a project to assess the state of the Northeast Organic Seed System (NOSS). Motivated by a desire to address uneven access to resources, potential opportunities for collaboration, and other key issues and concerns among conference attendees, organizers of the NOSC and researchers at UVM worked together to create a needs assessment revolving around the 2021 NOSC.

Through this collaboration, this needs assessment involved three components: (1) observational note-taking during conference sessions (17 sessions with 387 total attendees), (2) a day of collaborative group sessions focused on assessing the current state and future priorities of the NOSS (with 30 participants), and (3) a post-conference survey (n=118). Themes and impressions gleaned from the note-taking and group sessions informed the development of the post-conference survey, which is the focus of this report. These survey findings are complemented with qualitative insights from the note-taking and group sessions.

### KEY FINDINGS OF THIS REPORT

- Survey respondents representing key stakeholders in the seed system (e.g., farmers, commercial seed producers, community and home-based seed workers) felt **most connected to seed companies (63.3%) and regional/national non-profits (61.5%) and least connected to researchers/scientists (41.7%) and plant breeders (39.6%)**. While there is interest in connecting more with plant breeders (40.9%), there are fewer respondents interested in connecting with researchers/scientists (27.3%). Overall, respondents felt **most interested in connecting with community-based seed workers (54.6%)**.
- Participants indicated an **openness and willingness to connect with other stakeholders and develop relationships, including those of different ages (100.0%), races/ethnicities (99.1%), and from across the Northeast (99.1%)**. With regards to developing connections with others, respondents were **most interested in learning from each other (59.1%), engaging in research and experimentation (43.6%), and discussing the cultural meaning of seeds (42.7%)**.
- Respondents **perceived that the NOSS performs well** in certain aspects of social, environmental, and economic sustainability, including **environmentalism (88.5%), innovation (88.0%), and being welcoming of new producers (86.8%)**. However, **less certainty existed around the inclusivity of marginalized groups (59.8%)**, aligning with concerns articulated during the conference about the exclusion that seed workers who are people of color experience from resources and opportunities.
- Survey respondents also felt **a strong sense of autonomy (95.0%) around their seed work**, though felt **less empowered to establish profitable business ventures (52.2%) and to influence policy (48.5%)**.

- **Information about growing (87.5%) and harvesting/processing seed (81.7%) were the most accessible resources** to respondents while **the least accessible resources included legal advice (14.7%) and funding for commercial (14.1%) and non-commercial work (14.1%).**
- **Lack of financial resources (67.3%) and available time (64.3%) were the most common challenges.** This is supported by conference attendees' various concerns around funding seed work and the economic risk involved with entering seed work to sustain one's livelihood, especially for younger people and people of color.
- **Participants' indicated interest in programming beyond their technical and logistical needs, such as the promotion of regionally adapted seeds (97.0%) and seed sovereignty movement (93.9%),** findings that align with perspectives articulated at the conference. High interest in a diverse set of topics suggests an eagerness to learn about both the practice of growing seeds and the social, political, and cultural components that structure the seed systems.

## RECOMMENDATIONS

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- ⇒ **MORE READING MATERIALS, PANELS, AND OTHER EDUCATIONAL RESOURCES** to engage with diverse ideas and expertise around social and political topics, such as seed sovereignty, open access seeds, seed rematriation, and the economic and non-economic value of seeds.
- ⇒ **MORE SEED-RELATED INITIATIVES, EVENTS, AND GATHERINGS ON A STATE/LOCAL LEVEL** to build stronger networks of community-based and home-based seed workers, generate interest among young people, and create more awareness around the benefits of locally and regionally adapted seeds.
- ⇒ **PAIRING OUTREACH AND RELATIONSHIP BUILDING WITH MATERIAL SUPPORT** like resource redistribution and labor compensation, with a focus on people of color and limited resource workers, to strengthen networks and enhance opportunities in the NOSS.
- ⇒ **GREATER SUPPLY CHAIN AND BUSINESS TRANSPARENCY AMONG SEED COMPANIES** to stimulate dialogue around ethical commercialization of seeds.
- ⇒ **GREATER FINANCIAL AND OTHER RESOURCE INVESTMENT FROM UNIVERSITIES, STATE/FEDERAL AND PHILANTHROPIC ORGANIZATIONS** to support diverse and non-commercial seed activities, such as legal advice and seed policy education.
- ⇒ **INCREASED WAGES AND OTHER FORMS OF COMPENSATION** for unpaid or underpaid seed workers.

## INTRODUCTION

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Seeds are often viewed simply as agricultural inputs and economic commodities, but for many, they are also at the nexus of spiritual, cultural, and political identities. The stewardship of organic seeds has far more intimate and personal meanings than often recognized, and many begin working with organic seeds as an avenue to address social, political, and environmental ills. The Northeast Organic Seed System (NOSS) is comprised of people for whom seeds are incredibly meaningful and whose work contributes to regional biodiversity and the vibrant organic food movement in the Northeast. However, while organic seed work in the Northeast is quite robust, no systematic assessment of the strengths and areas for improvement of the regional seed system has yet been conducted.

This needs assessment provides a preliminary attempt to characterize the NOSS with the hopes to catalyze future partnerships, initiatives, and discussions. The assessment was driven by a few central questions of importance: What are the networks and relationships that exist in the NOSS? What kind of resources and barriers to resources exist, and for whom? What are the values and priorities within the NOSS? And finally, what opportunities exist for change and support in the pursuit of aspirations like sustainability, sovereignty, and justice?

## DATA COLLECTION

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The findings of this needs assessment are drawn from a culmination of data collection revolving around the 2021 Northeast Organic Seed Conference (NOSC) during the week of January 16 – 23, 2021. Held virtually, conference organizers and UVM researchers worked collaboratively to produce data through (1) conference note-taking to capture the viewpoints and experiences of presenters and participants, (2) session notes from groupwork during a needs assessment day for participants to think together about their experiences and visions for the NOSS, and (3) a post-conference survey to gather quantitative data on the themes that emerged from the notes and group work.

Note-taking took place during the NOSC itself, which consisted of 22 virtual sessions over the course of the conference. Save for five sessions during which sensitive community conversations took place, there were two note-takers present at each conference session for a total of 17 sessions. These sessions consisted of five two-part session series (topics included: seed saving, seed production, plant breeding, Indigenous seed stories, and an ecotypic seed system) as well as sessions titled Pushing Boundaries, Holistic Botany, Resilience Seed Community, Seed Activism and Non-profits, Seed Internships and Mentorships, and Seed and Plant Pathology of Common Northeast Seed Crops. There was also a keynote speech by Dr. Banu Subramaniam on decolonizing botany (more information about the conference can be found [here](#)).

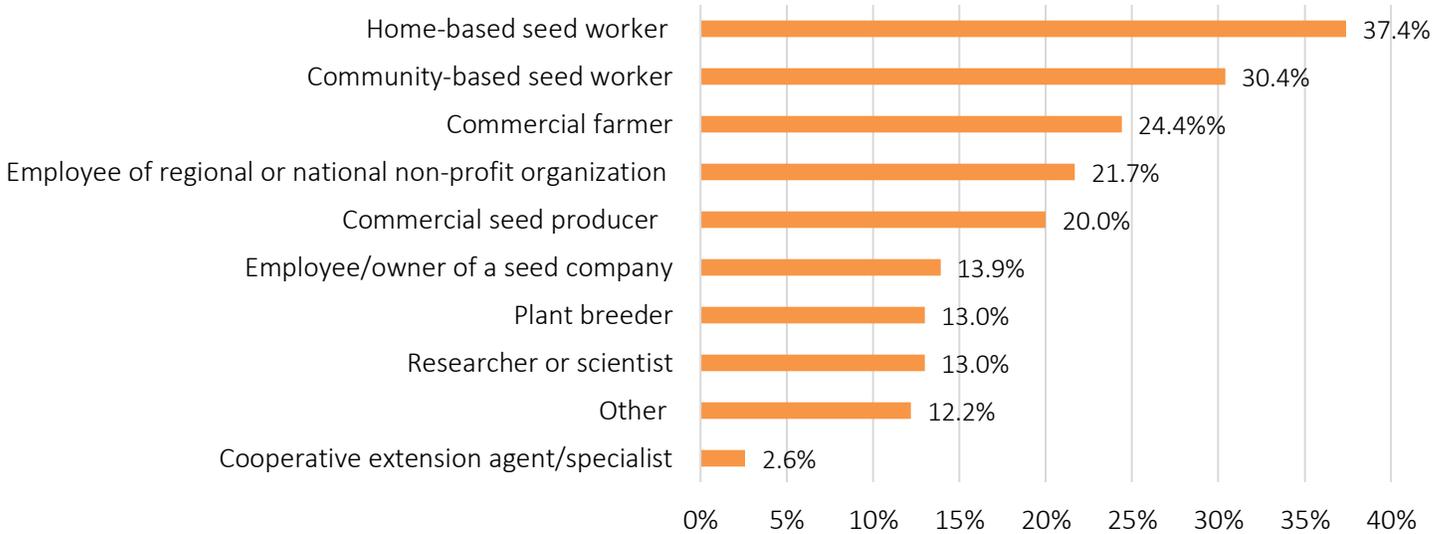
The all-day needs assessment group sessions took place the day after the conference ended (January 24, 2021) and was designed in collaboration with and facilitated by two conference organizers. This day involved three 1.5-hour sessions where (mainly) conference attendees and (a few) non-attendees engaged in group sessions assessing the NOSC and NOSS. Participants were organized into groups based on their primary work in the seed system: seed producers/farmers who save seed, plant breeders/seed companies, home-based seed workers, and community-based seed workers. Using worksheets and activities, participants reflected on their experiences in the conference and NOSS during the first session, took stock of their sector's strengths and

weaknesses in the second session, and developed collective goals and visions for their sector in the final session. In total, approximately 30 individuals participated in the assessment day.

As a follow up, an online post-conference survey was designed based on the themes that emerged from the qualitative findings from conference notes and needs assessment discussions. In late June 2021, the survey link was sent to the 387 registrants of the 2021 NOSC, who were also encouraged to share the link with other Northeastern seed workers who did not attend the conference. We accepted responses for approximately one month and received 118 responses (106 from conference attendees and 12 from non-attendees). Because this assessment is grounded in the experiences of conference attendees and a few individuals in their networks, this work is limited in its characterization of the activities and experiences existing within the NOSS but provides important insight that can assist in the continued development of the NOSS.

## SURVEY DEMOGRAPHICS

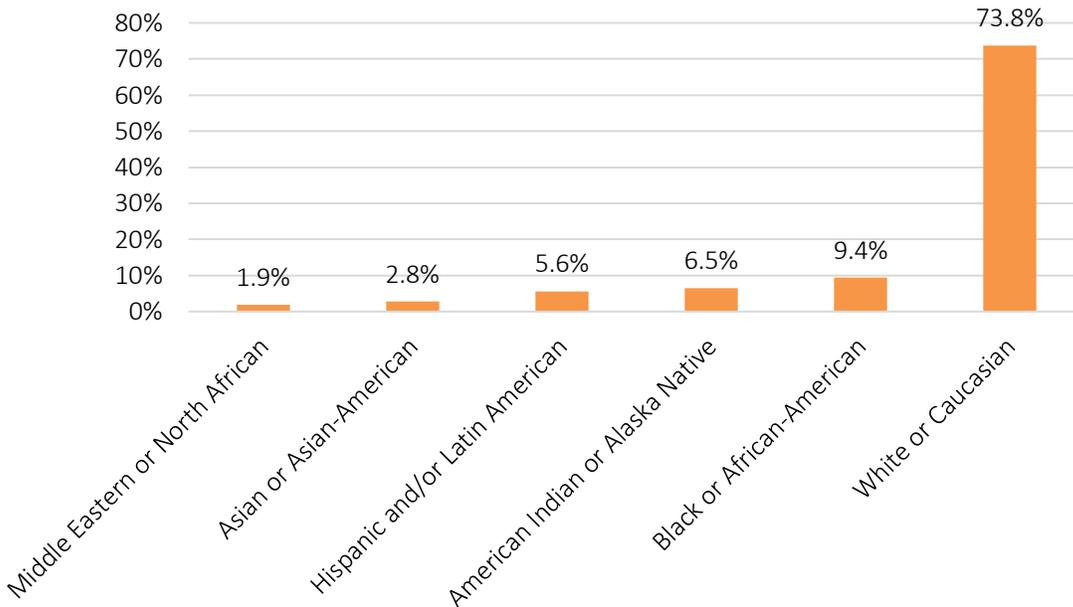
People in the Northeast engage in seed work in a myriad of ways, as indicated by survey responses (Figure 1). Home-based seed workers (37.4%), and community-based seed workers (30.4%) were most represented in the survey, though commercial farmers (24.4%), and employees from regional/national non-profit organizations (21.7%) were also well-represented. Among those who selected “other,” respondents mostly identified as educators, students/faculty, or employed (currently or formerly) in environmental/agricultural work and research.



**Figure 1. Roles in the Northeast Organic Seed System (n=115)**

Note: Respondents could choose more than one choice, so percentages do not add to 100%.

In terms of racial representation, most survey respondents (73.8%) self-identified as White, followed by Black (9.4%) and American Indian / Alaskan Native (6.5%) (Figure 2). Because conference attendees were not required to share their demographic information during conference registration, we do not have complete data



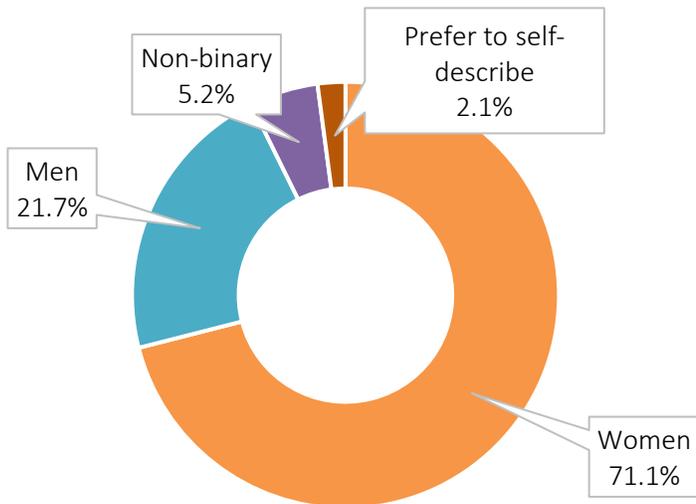
**Figure 2. Race & ethnicity of survey respondents (n=107)**

Note: Respondents could choose more than one, so percentages may not add to 100%.

around the racial representation of conference attendees, though some chose to self-report details about their race and gender. Of the 197 conference attendees who self-reported their race, 78.2% were White, 5.6% were Black, 5.6% were Indigenous/First Nations, 4.1% were Hispanic and/or Latin American, 3.6% were Asian/Southeast Asian, and 3.0% identified as “other.” These percentages

align closely to the racial representation of survey respondents. Given that a primary driver of the needs assessment stemmed from the recognition that the NOSC needs to be more inclusive, conference participation and survey responses indicate that more attention and effort must be dedicated to continuing to expand opportunities for underrepresented populations to participate in regional seed efforts in the future.

Among the 97 survey respondents who reported their gender identity, 71.1% identified as women, 21.7%



as men, 5.2% as non-binary, and 2.1% self-described their gender as gender-nonconforming or questioning non-binary. (Figure 3). Similar percentages existed among those conference attendees who self-reported their gender (n=180): 66.7% identified as women, 24.4% as men, 5.0% as gender non-conforming, 0.5% as transgender, and 3.3% chose “other” or preferred not to say.

The average respondent was 45 years old, although respondents ranged in age from 19 to 78 (n=97). In terms of experience in seed work, respondents’ answers ranged from having no experience to 51 years of experience, with the average respondent having 9.1 years.

Every state and province within the Northeast were represented among respondents to some extent, except for New Brunswick (Figure 4). The state with the highest percentage of survey respondents was New York (37.1%), a reflection of the collaboration between the NOSC and the Northeast Organic Farming Association- New York (NOFA-NY) Winter conference. Massachusetts (10.5%) and Vermont (8.6%) were the states / provinces with the next highest representation among survey respondents (Figure 4). While good coverage across the region existed, the relatively lower number of respondents from most states / provinces (as compared to New York) points

Figure 3. Gender identity of survey respondents (n=97)

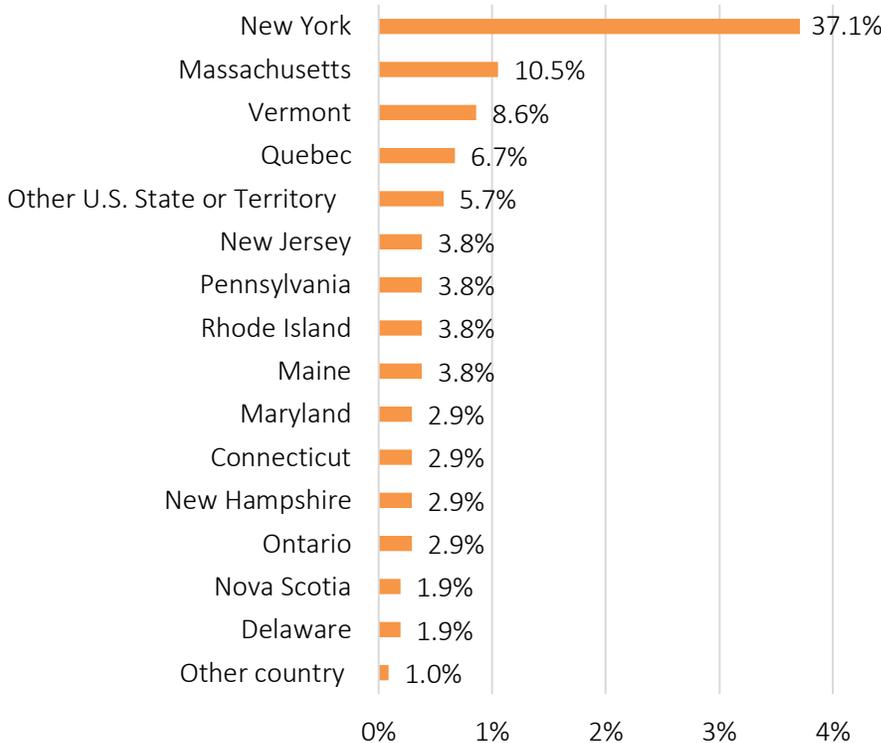


Figure 4. Geographic location of survey respondents (n=105)

to a need for more concerted effort to engage other NOFA chapters across the Northeast to increase geographic representation for future conferences.

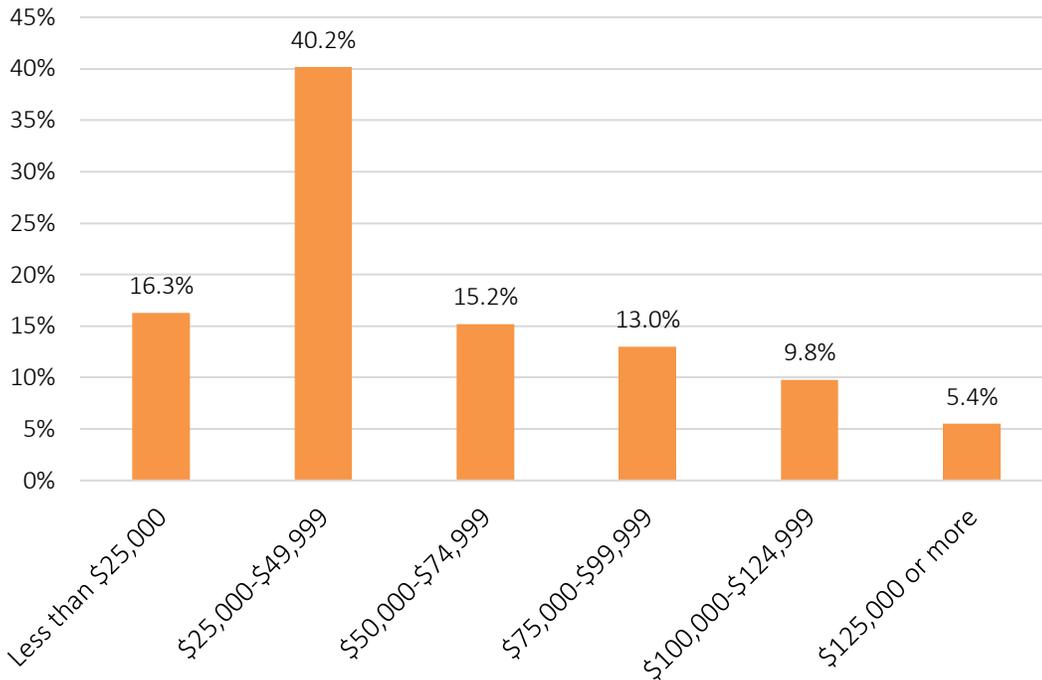


Figure 5. Total household income for 2020 (n=92)

Regarding income, we found that among 92 respondents who provided responses, 56.5% had a household income of \$49,999 or less in 2020 (Figure 5). Additionally, of 105 respondents, respondents’ households on average earned 40.7% of income from off-farm work. We also found that of 106 respondents, seed-related work accounted for 15.5% of the average respondents’ total household income, while other agricultural

employment accounted for 24.8% on average. Among respondents who shared their educational background (n=106), most respondents had at least a 4-year college degree (81.1%), and 12.3% had some college education.

## SEED WORK & PRACTICES

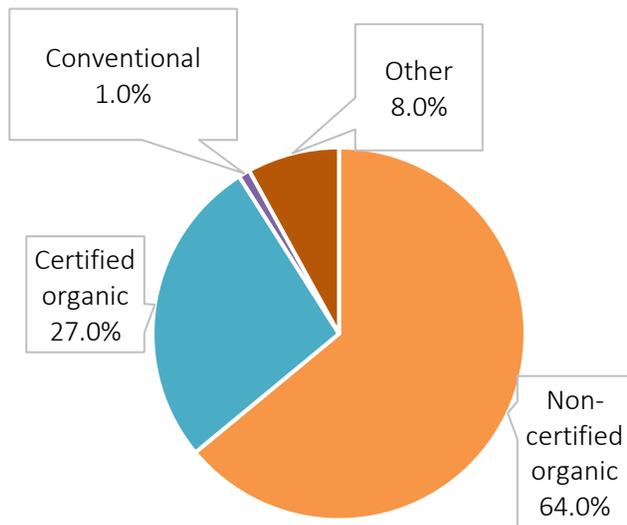
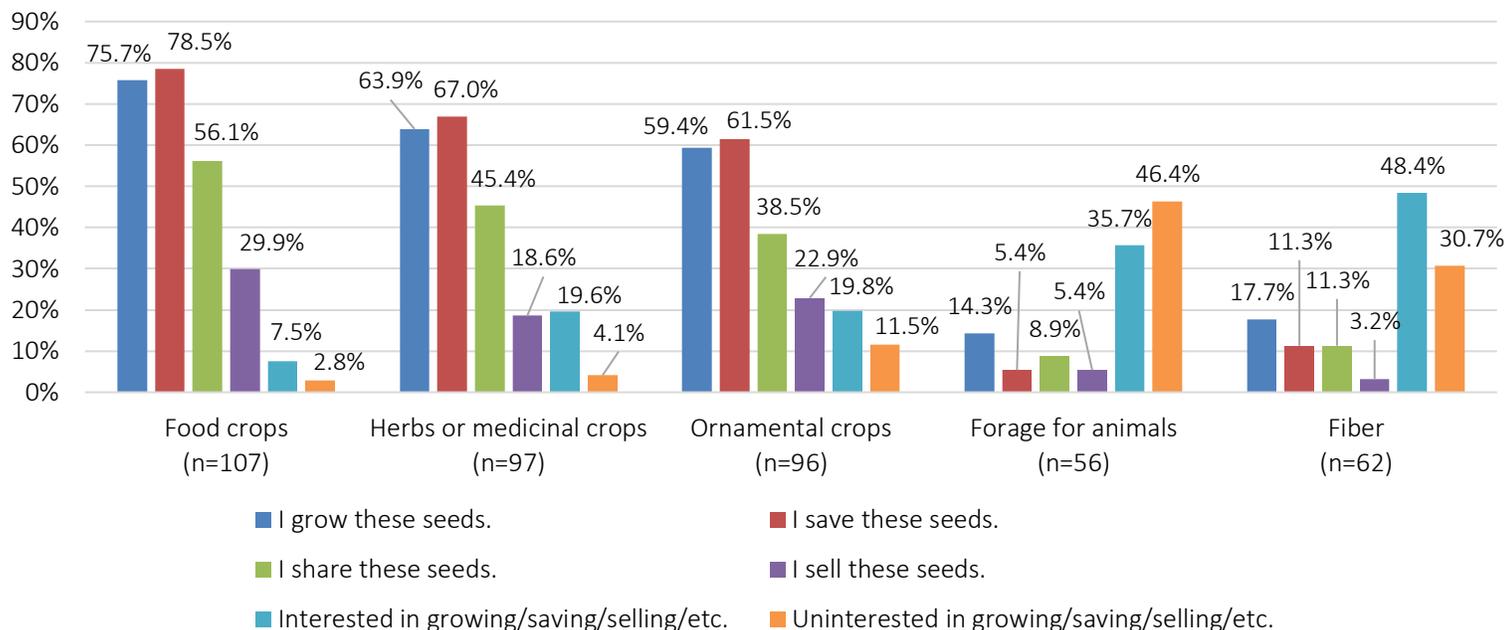


Figure 6. Survey respondents' growing techniques (n=100)

Survey results indicate that most respondents grow seed crops using organic techniques but are not officially certified (Figure 6). Given that community- and home-based growers represented a large portion of the respondents, this is not particularly surprising since certification is likely not a priority. The lack of organic certification does not mean that seed workers in the regional seed system are not committed to organic principles, but rather, certification may be irrelevant or challenging to establish. Along this vein, prominent discussion at the 2021 NOSC about the importance of regional adaptation of diverse crops points to the

commitment that regional seed workers have towards environmental sustainability.

Respondents' motivations for growing seeds are primarily for personal use (63.8%) and community use (46.6%) (n=103)<sup>1</sup>, although extensive dialogue occurred during the conference about commercial seed production and developing a greater market for organic seed. Given the discrepancy between the primary use of survey respondents (home-based and community-based) and the degree of focus on commercial production at the conference, future inquiry should explore whether commercial seed production is a significant area of interest that is not adequately captured in this survey or whether issues of commercialization are over-represented at the conference compared to the primary interests of attendees.



**Figure 7. Types of and interest in seed activity across different crop types among survey respondents**

*Note: Respondents could choose more than one answer, so percentages do not add to 100%.*

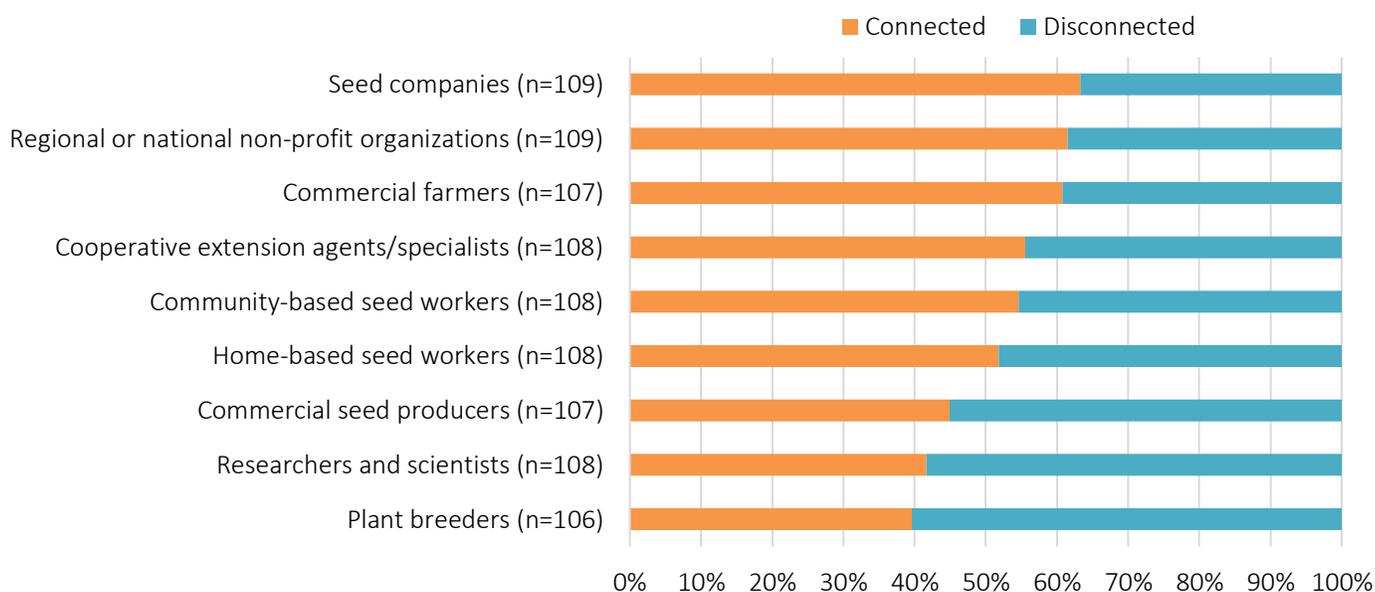
Across most crop types (food, herbs/medicinal, ornamental, forage, fiber), growing and saving seeds were the most common activities, and selling seeds was least common. Given that sharing seed was more common than selling seed across crop categories, the findings point to more engagement among respondents in the informal seed system than the formal system. As displayed in Figure 7, respondents indicated that they most commonly grow and save seeds for food crops, followed by herbs or medicinal crops, and ornamental crops (flowers, grasses, etc.). The popularity among these three crop types are reflected in the array of crops discussed throughout the conference, such as Aosta Valley Tomatoes, Indigo, and Morning Glories. The diversity of cultivars grown, saved, and distributed, as indicated in the survey, aligns with the repeated mention of food security or sovereignty during the NOSC as a goal or vision for the NOSS to support, given that crop diversification is core to food sovereignty and regional biodiversity efforts. Relatively fewer respondents provided answers around animal forage and fiber, pointing to lower levels of attention to seeds/planting materials for animal forage and fiber among respondents. However, among those who did respond, there was relatively high level of interest in working with planting materials for fiber plants compared to levels of disinterest and relatively more interest in

<sup>1</sup> For these survey questions, respondents could choose more than one answer, so percentages do not add to 100%.

working with planting materials for animal forage than those disinterested. This points to potential opportunity to enhance activity around animal forage and fiber crops in Northeastern states where livestock to production systems are prominent.

## NETWORKS & CONNECTIONS

Networks and connections are an integral component of seed systems; however, the ability to forge relationships – and the role of those relationships - among stakeholder groups seem to depend on their position in the seed system. For example, during the needs assessment group sessions, the community-based seed worker group shared mixed feelings around their reliance on seed companies and government resources for sourcing seeds while the plant breeder and seed company group unambiguously listed community seed networks as assets to their work, suggesting that different perceptions of priorities and relationships in seed networks exist among different groups. To better understand these kinds of relationships and dynamics in the NOSS, we asked respondents about their connections to various stakeholders, with which stakeholders they would like to have more connection, and their reasons for connecting with others.<sup>2</sup>



**Figure 8. Survey respondents' connections to various groups in the NOSS**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

Respondents felt most connected to seed companies (63.3%) and regional/national non-profit organizations (61.5%) and least connected to researchers/scientists (41.7%) and plant breeders (39.6%) (Figure 8). These survey findings affirm community-based seed workers' discussion during the needs assessment group sessions around their reliance on seed companies, though further investigation is required to probe issues of trust as well as if and how this dependence intersects with values such as mutual aid underpinning their work. Compared to other groups, community-based seed workers focused the most on how to cultivate relationships

<sup>2</sup> For these questions, "connected" was defined as having ties to others for support (including personal and emotional support) and/or access to resources and information.

with other community-based groups during the needs assessment group sessions, strategizing about which online platforms would best suit their efforts and sharing their experiences of finding like-minded seed workers. Thus, given that community- and home-based seed workers are most represented among respondents, it was unsurprising that respondents were most interested in connecting with community-based seed workers (54.6%), when asked (Figure 9). And, again, this also prompts us to consider how groups within the formal and informal seed systems interact and view one another in the pursuit of their goals.

Considering that the needs assessment group sessions indicated mixed attitudes towards formal seed institutions like universities and seed companies among community-based seed workers, enhanced opportunities for open dialogue may be necessary to reconcile the priorities of community-based seed groups with other stakeholders' enthusiasm for working with them. The survey results provide further evidence for this possibility for dialogue: when compared with the findings that respondents felt least connected with these groups (Figure 8), respondents' interest in connecting with plant breeders and commercial seed producers (Figure 9) is particularly insightful. This suggests that respondents, who largely represent community-based and home-based seed workers, are interested in engaging with groups who are involved in commercial and university-based seed work.



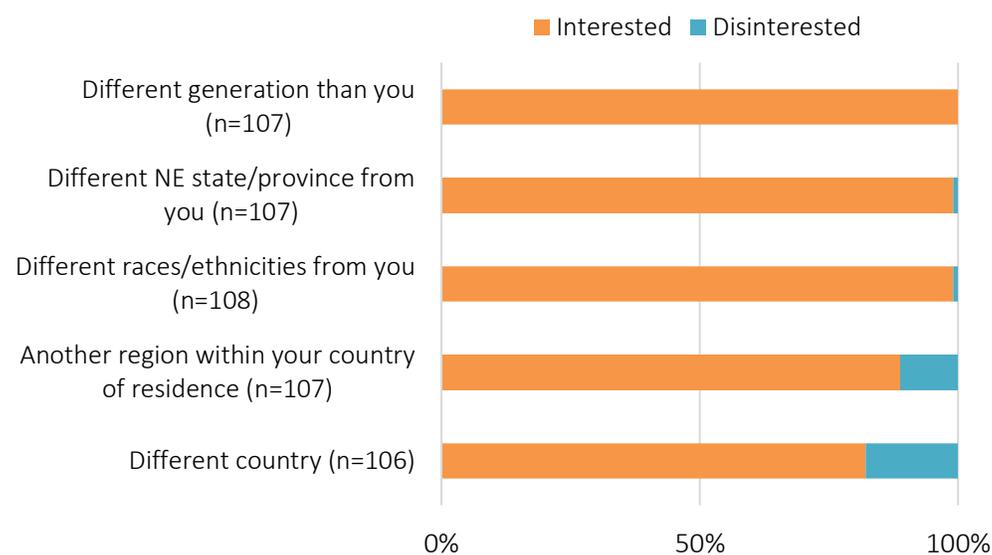
**Figure 9. Survey respondents' interest in connecting with various groups in the NOSS (n=110)**

*Note: Respondents were allowed to choose more than one answer, so percentages do not add to 100%.*

In contrast to plant breeders and commercial seed producers (groups with whom respondents felt relatively lower levels of connection but relatively high interest in forming connections), researchers and scientists were a group with which respondents experienced low connection (41.7%) (Figure 8) and low interest in developing connections (27.3%) (Figure 9). We also find that respondents are relatively well connected to Extension agents but expressed the least interest in pursuing connections with them. This perhaps points to varying relationships with different university entities: while respondents did not feel particularly high connection with university researchers/scientists, they were more commonly connected with Extension, which could possibly explain their lack of interest in pursuing additional university connections.

Given barriers to accessing researchers and skepticism towards institutionalized science articulated by conference participants, it could be that respondents are wary of researchers/scientists or are unable to reach

them, with some conference attendees expressing concern that universities are gatekeepers to resources, excluding many outside academia. While it's important to note that plant breeders can be affiliated with seed companies, universities, and government institutions as well as be university trained or self-taught, this sentiment of university gatekeeping was also seconded by plant breeders/seed company representatives. During their needs assessment group session, participants noted that public plant breeders (who are often employed by universities) are "rarely inclusive" when deciding breeding priorities. Universities were also cited as both an asset and a challenge among the community-based seed group and plant breeders/seed company group during the group sessions. These perceptions highlight how universities have contributed to inequality in seed work, a point that even university affiliates, at least those present at NOSC, acknowledged.



**Figure 10. Survey respondents' interest in connecting with other seed workers of various demographics**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

Conference attendees, primarily community-based and home-based seed workers, highlighted the need for more archives from older or more experienced seed workers and more mentorship opportunities to cultivate the transfer of intergenerational knowledge.

After considering their current and desired connections with other seed system stakeholders, survey respondents (n=110) were then asked about their top reasons for connecting with others.<sup>3</sup> The three most popular responses were to (1) learn about other kinds of seed work that they are not involved in (59.1%), (2) collaborate for research and experimentation (43.6%), and (3) share cultural meaning around seeds with others (42.7%). The least popular reason for connecting with others was to sell seeds (3.6%). These responses suggest that respondents value seeds beyond the economic realm as well as an interest in building partnerships and creating goals with people involved in diverse spheres of seed work. Given that respondents already feel most connected with seed companies (Figure 8), respondents may feel interested in cultivating relationships that focus

Overall, survey respondents expressed high degree of interest for collaboration with others. In particular, respondents were most interested in connecting with people across generations (100.0%), the Northeast (99.0%), and race/ethnicities (99.0%) (Figure 10). Interest in multigenerational partnerships emerged during the conference as well, when attendees expressed concern about the potential loss of inherited knowledge from older people and the lack of youth engagement in seed systems.

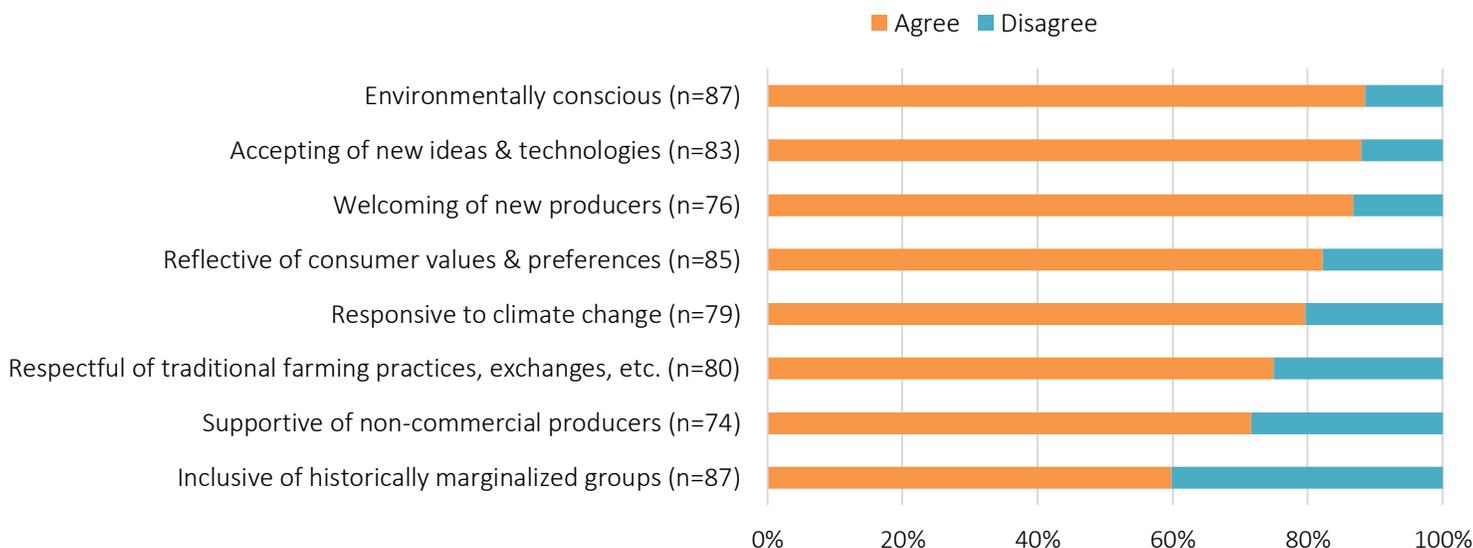
<sup>3</sup> For these survey questions, respondents could choose more than one answer, so percentages do not add to 100%.

on sharing personal values around seeds or collaborative problem-solving outside of commercial channels, though accurately documenting specific reasons requires future research.

## PERCEPTIONS & THE ROLE OF POWER IN THE NOSS

Systems are comprised of networks and relationships, and these ties include more than the movement of material resources; ideas, values, and knowledge are spread through these relationships, which shapes participants' priorities and perceptions of the system itself. Throughout the NOSSC, we observed attendees grappling with ideas of power and discussing the role of seed systems in broader societal power dynamics. From land acknowledgements at the start of each session to sessions explicitly designed to address oppressive seed practices and the decolonization of science, the conference content focused on technical, logistical, social, cultural, and political dimensions of seed work. Survey questions were therefore developed to assess respondents' perceptions of the NOSS and of their own power in the system.

Generally, survey respondents agreed that the NOSS performs well in multiple areas, primarily environmentalism (88.5%), innovation (88.0%), and support for new producers (86.8%) (Figure 11). However, respondents were more split in their agreement on the inclusivity of marginalized groups (59.8%) (Figure 11). This result is further complicated by tensions between White attendees and attendees of color, when questions of resource redistribution and best practices were raised. Questions from White attendees about how they can support seed workers of color or become better allies generated suggestions from some attendees of color in the audience as well as some frustration towards stagnating, cyclical conversations that have yet to result in much material change for seed workers from marginalized groups.



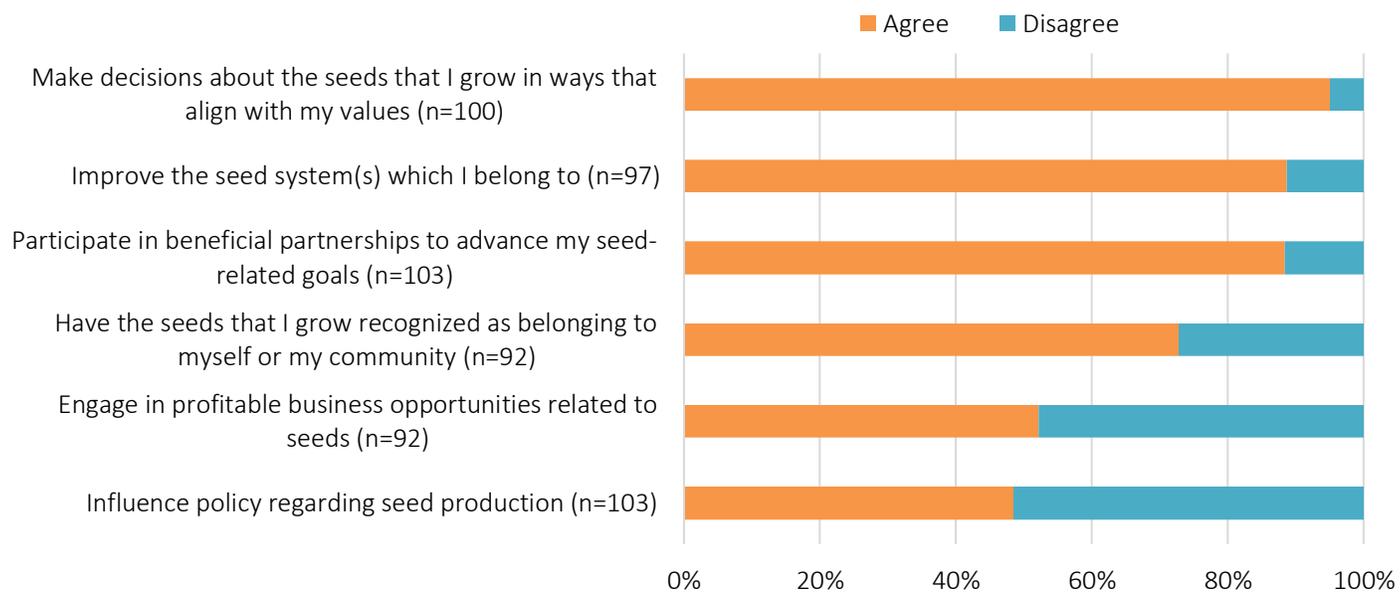
**Figure 11. Agreement levels among survey respondents regarding the NOSS' performance in several areas**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

For example, during the first session on seed saving, a White attendee raised this particular question around allyship that elicited a range of responses which included a few attendees of color expressing the burden of being asked repeatedly about how White seed workers can be more supportive. While survey respondents, who were overwhelmingly White, are very interested in building relationships with people of different

racas/ethnicities (Figure 10), it is important to note that Indigenous and other attendees of color expressed throughout the conference their hesitance and wariness towards engaging with White seed workers due to experiences of “White saviorism” and historical and continued exploitation. When survey respondents were asked to share comments about obstacles they experience in the NOSS, a respondent shared: “... the overwhelming whiteness and the fact that white people are holding onto and even selling and profiting from!! the seeds that many of us are trying to reconnect with.” This quote offers another example of the kinds of racial and economic dynamics that exist among seed workers that perpetuate oppressive power dynamics.

Between the survey results and the conference dialogue, we can assume that many White seed workers are not in regular conversation or community with seed workers of color, prompting us to look closely at survey responses around issues of respect and inclusion. Over half of respondents believe that the NOSS is inclusive of marginalized people, and 75.0% indicated that the NOSS respects traditional agricultural practices (Figure 11). Though survey data do not capture further detail, these findings nonetheless raise questions about whose traditions are being respected, and whether respect alone is enough to create inclusion and material support. For example, attendees and speakers at the Indigenous Seed Collaboration session spoke about how seed rematriation efforts are not often accompanied by further interest in Indigenous communities’ capacity to practice their seed traditions as they see fit. In this case, speakers were pointing to dissonance between respect and inclusion—gestures of respecting Indigenous traditions through rematriation becoming occasional acts rather than continuous and in-depth relationships.



**Figure 12. Agreement with "I have the power to..." statements among survey respondents**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

While identifying areas for change to strengthen the seed system is a necessary step, identifying who already feels empowered to shape the seed system and in which areas can reveal opportunities to create a more democratic seed system. Respondents feel most confident in their ability to make decisions in alignment with their values (95.0%), improve the NOSS (88.7%), and to participate in beneficial relationships (88.4%) (Figure 12). However, there are two areas where respondents were divided about their power in the NOSS: 52.2% of

respondents feel they have the power to engage in profitable seed business opportunities and 48.5% of respondents feel they have the power to influence seed production policy (Figure 12).

While policies about organic seed production were not a prominent theme during the NOSC, the uncertainty around profitability and navigating commercial seed production was raised by some attendees. Seed producers and plant breeders inquired about the profit potential of uncommon crops or new varieties in the market, and the financial risk involved with growing crops organically. It is also important to note that policymaking and commerce are core components of the formal seed system, which may feel more removed to survey respondents, most of whom largely engage in informal seed systems.

The overall sense of freedom and authority within the NOSS indicated by the survey responses likely reflect the racial resource gaps among seed workers that was raised during the NOSC. While an overwhelming percentage of respondents (95.0%) agreed that they can make decisions about seeds that are aligned with their values, several seed workers of color and under-resourced growers at the conference expressed their struggle to access culturally significant crop varieties and limited connections with groups willing to redistribute resources. For example, for immigrant or first-and second-generation seed growers, sourcing seeds from their family's region may be cumbersome due to U.S. government regulations on importing seeds. One presenter during the Pushing Boundaries session mentioned that seeds they ordered to the U.S. from another country could not ship due to supply chain problems in 2020 and that sourcing seeds for culturally significant crops was a substantial challenge to their farming operation. These challenges limit the participation of immigrant or refugee seed workers and their sense of autonomy as well as neglect the needs and interests of ethnically diverse consumers who are interested in crops not commonly found in the Northeast.

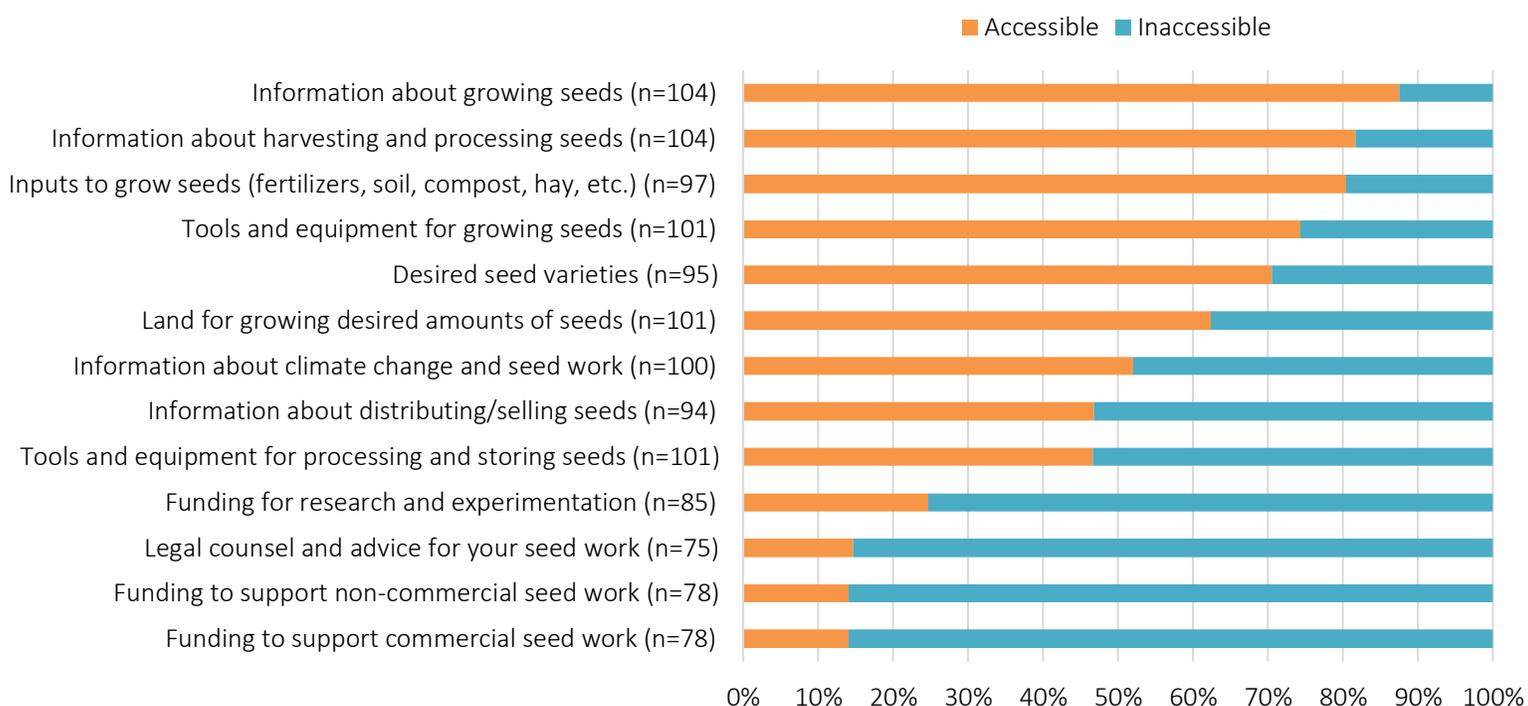
## RESOURCE ACCESS & BARRIERS

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Participation and autonomy in seed work is shaped and reinforced by (barriers to) resource access. Some NOSC attendees address these resource challenges by repurposing items around their home to create threshing tools or utilizing toolkits and online courses developed by the Organic Seed Alliance around seed economics and commercial seed production. As much as these resources allow attendees to do their work, a pressing question embedded throughout the conference was whether people have access to the resources they need for the kinds of seed work in which they want to engage. We therefore asked survey respondents about their access to various resources.

During the conference, participants articulated a skewed landscape of resources in which those in the formal seed system (e.g., universities, seed companies) have more access to funding, a wider range of networks, and other forms of capital than those primarily engaged in the informal seed system (e.g., seed libraries, community gardens). For example, while describing their years-long breeding trials and research, presenters in one of the plant breeding sessions acknowledged that they received university support to conduct their work and other breeders cited their academic connections as critical to accessing seeds from international seed banks. Alternatively, unless community-based or home-based seed workers have these credentials or can draw upon their networks, accessing these resources is more difficult. This point was raised during the needs assessment group sessions, when community-based seed workers cited a lack of funding that creates a sense of insecurity in their work.

The survey data below in Figure 13 supports these perspectives. The resources that were most accessible to respondents are information about growing seeds (87.5%), information about harvesting and processing seeds (81.7%), and inputs to grow seed (80.4%), all of which have relatively low barriers to access. During the conference, sharing information on these topics was prominent, as attendees used the chat function intensively to provide recommendations for books and websites. On the other hand, some of the most inaccessible resources are those that are typically scarce outside of the formal seed system: funding for research/experimentation (24.7%), legal support (14.7%), and funding for non-commercial seed work (14.1%). In addition, commercial seed producers' concerns about lack of profitability and difficulty in scaling up were further supported by survey data, which indicated that only 14.1% perceived funding for commercial seed work as accessible.



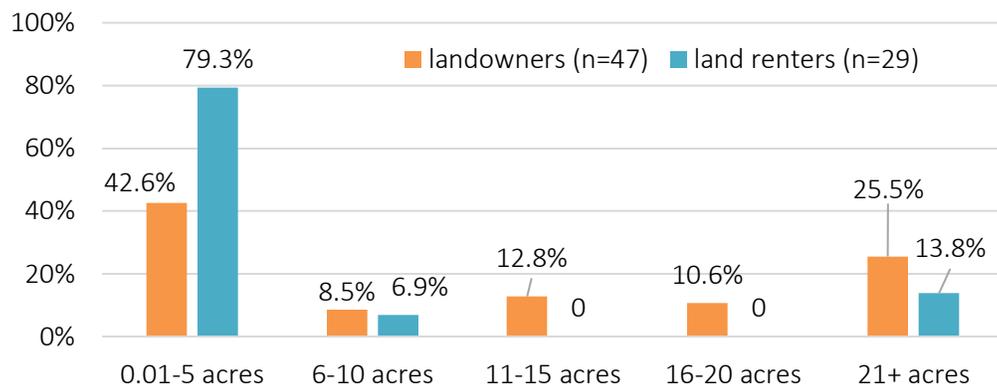
**Figure 13. Survey respondents' access to resources for seed work**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

Because access to land is a major issue in agriculture, we asked respondents about their land access—how much, through what means, and for which purposes they use it. Of the 118 respondents who completed the survey, 109 respondents indicated some kind of access to land: 43.1% own land and 25.7% rent land, while fewer people have access through a community garden (8.3%), an educational institution (7.3%) or religious institution (3.7%). And, 11.9% of respondents indicated that they have access to land through other means, mostly through their employer or a friend/family member.

While more than half of respondents have access to land, *sufficient* space and land for growing and maintaining isolation distances was a prominent issue raised by conference attendees. For example, attendees in a seed saving session, as well as the home-based seed workers at the needs assessment session, spoke of the challenge of accessing the amount of land necessary to meet the isolation requirements for preventing unintended cross-pollination. Thus, land constraints that affect seed work across different geographic contexts

(i.e., rural and urban) and social identities (i.e., race, ethnicity, etc.) must be addressed. Figure 14 shows that close to half of the landowners own 5 acres of land or fewer (42.6%), and almost twice that many (79.3%) rent 5 or fewer acres.

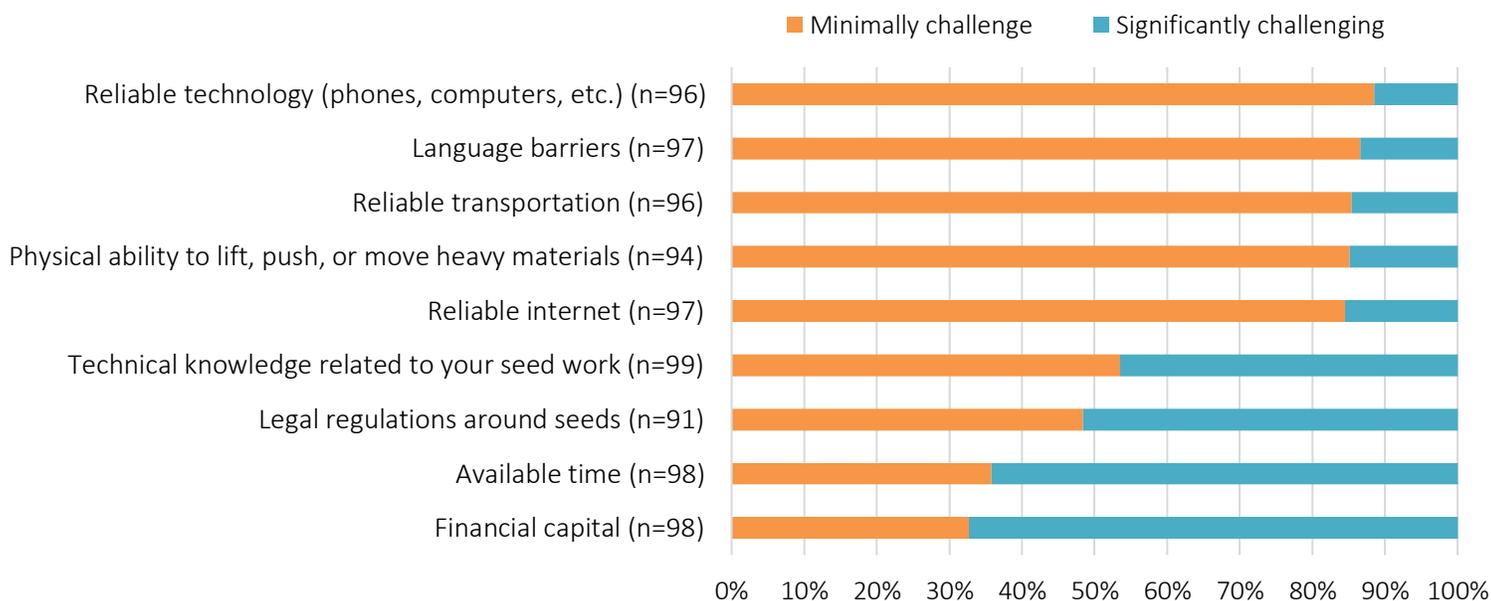


**Figure 14. Survey respondents' total acreage of land among landowners and land renters**

It is worth noting as well that the historical and continual exclusion of Black, Indigenous, and farmers or growers of color from accessing land was repeated during the conference as a challenge for creating a more democratic and resilient seed system.

Regarding challenges experienced by respondents, lack of financial capital (67.3%), lack of time (64.3%), and legal regulations around seeds (51.7%) are the most significantly challenging obstacles. Throughout the week of the conference, attendees discussed difficulty obtaining funding and financial resources. Commercial seed producers raised the point about

Regarding challenges



**Figure 15. Perceptions of challenges among survey respondents**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

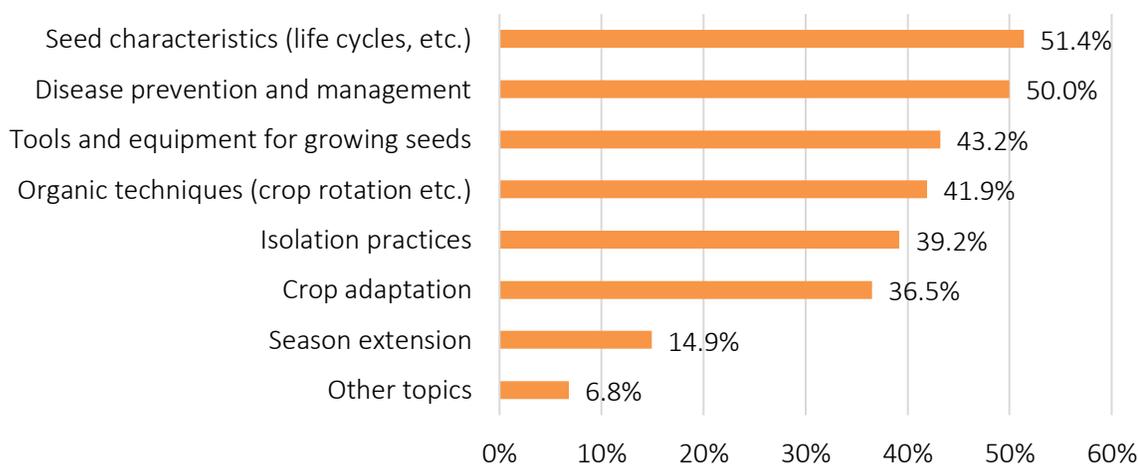
the risk of the challenge of transitioning to full-time organic seed production to sustain a livelihood; small-scale seed companies also felt hindered by the financial risk of selling organic seeds that may not yield as much or as uniformly as conventional seeds; and home- and community-based seed workers spoke of insufficient compensation for their labor or minimal funding for their work. The lack of time indicated by survey respondents might reflect the informal nature of most of the seed work conducted by survey respondents, who likely need to dedicate substantial labor time to generating income.

We also asked respondents about challenges that hinder or limit their ability to grow seed crops of interest to them to learn about production challenges but to also understand any implications to the regional crop diversity they already maintain. Among 42 respondents (a low number and thus reason to interpret these findings with caution), the most cited challenge was “doesn’t grow well in my area” (33.9%), indicating that climate, land, or other ecological conditions present a difficult barrier to growing some of the kinds of plants in which respondents are interested. Considering respondents feel least connected to plant breeders (Figure 8), this particular issue could potentially be addressed by greater and inclusive access to plant breeders and their work. However, it’s important to keep in mind that respondents’ challenges are both social and environmental in nature, meaning that focus must be dedicated to initiatives that foster both collaboration across sectors and pursue climate-conscious strategies. This type of multi-pronged approach was emphasized by needs assessment participants: when asked to list short-term, medium-term, and long-term goals towards building a more resilient regional seed system, ideas ranged from small scale actions like creating breeding mentorship programs to larger scale initiatives like shared regional seed processing facilities. Comprehensive approaches like the ones offered by participants will be necessary to pursue sustainability across all three of its domains: economic, social, and environmental.

## OPPORTUNITIES FOR CHANGE & SUPPORT

With the hope that this information can provide a springboard for future initiatives, we asked respondents about their various interests and preferences for future educational, programming, and research efforts. For respondents who indicated that information was not very accessible to them, they were then asked which specific topics they would like to learn more about related to seed production, processing, distribution, and climate change.

On the subject of growing seeds (Figure 16), most of the items received similar percentages of interest, indicating that respondents are generally interested in learning about growing seed crops. This contrasts with other subjects (Figure 17; Figure 18; Figure 19), where a single topic of interest was indisputably the most popular. Additionally, across various sessions at the conference participants indicated interest in technical topics focused



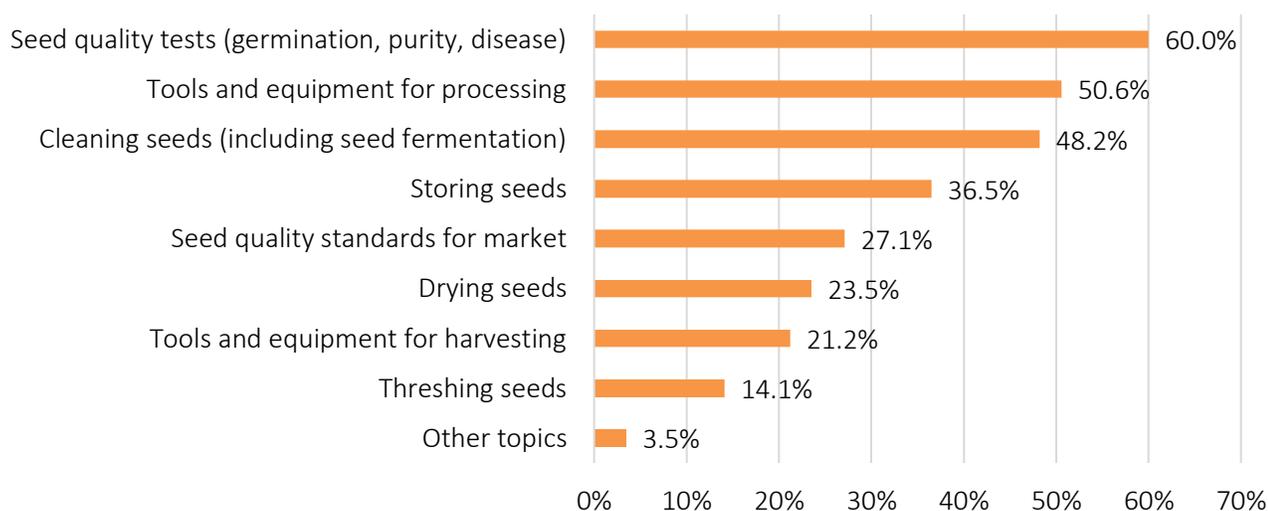
on seed production such as cross-pollination and pest management. Seed characteristics, such as anatomy, dispersal strategies, and germination vary widely by crop, so online information sharing strategies may be effective to assure that relevant

**Figure 16. Interest in topics related to growing seed crops among survey respondents (n=74)**

*Note: Respondents were able to choose more than one answer, so percentages do not add to 100%.*

resources are available across a wide range of plants. Attendees of the Pushing Boundaries session noted that Extension services and research cater to a limited range of crops, which negatively impacts growers who are interested in less common plants in the Northeast. This reinforces the importance of seeking expertise among those outside of academia. However, the knowledge and resources that universities can contribute should also not be overlooked, given that 55.6% of respondents feel connected to Extension (Figure 8).

Regarding topics of seed harvesting and processing, respondents were most interested in learning about seed quality tests (60.0%) (Figure 17). Seed quality tests may be an area of particular focus as a strategy that could save growers from planting or sharing seeds with low germination or purity rates. While there was some conversation at the conference around the social construct of “seed quality,” seed quality tests nonetheless remain an area that growers, seed sellers, and seed sharers are especially attuned. For some, it is a question of how to access these tests or implement their own. For others, seed quality tests were perceived as a necessary component of their work to demonstrate credibility and trustworthiness to others that their seeds are true to their description.



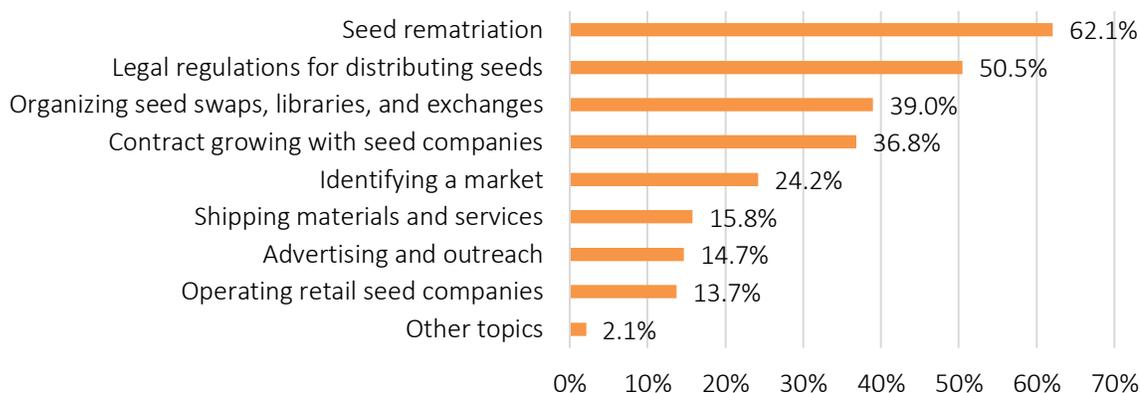
**Figure 17. Interest in topics related to seed harvesting/processing among survey respondents (n= 85)**

*Note: Respondents were able to choose more than one answer, so percentages do not add to 100%.*

To enhance the availability of processing equipment, the specific needs for beginning and veteran seed producers must be considered. As discussed at the NOSC, seed processing equipment and tools encompass a range of materials and tactics that have been created or repurposed from other items (such as windowsills, baskets, screens, etc.), demonstrating creativity and resourcefulness, which can support the inclusion of beginning seed savers. On the other hand, during a needs assessment group session, commercial seed producers highlighted the need for increased and more widespread processing equipment and facilities in the Northeast. These barriers to equipment point to a possible obstacle for growers who are interested in scaling up into commercial production. Tutorials, guides, brainstorming sessions, and grant applications focused on sharing, fabricating, utilizing, repairing, and maintaining processing tools and equipment may be an area to dedicate time and effort to enhance the strength and autonomy of the regional seed community.

The distribution of seeds—whether for barter, profit, or gift—is a central component of any seed system. In considering topics of interest regarding seed distribution, survey responses indicate that seed rematriation

(62.1%), legal regulations for distributing seeds (50.5%), and organizing seed swaps, libraries, and exchanges (39.0%) constitute the three topics with the most interest (Figure 18). These topics of interest relate to how seeds are governed, specifically questions of rules and norms around maintenance and use. Governance issues are thorny and often full of contention and disagreement but are nonetheless essential to address in the pursuit of fair and representative agreements around seed rights, credit, benefits, ownership, and sharing. We noted related dialogue underpinning the conference sessions and needs assessment groups, such as an emphasis on



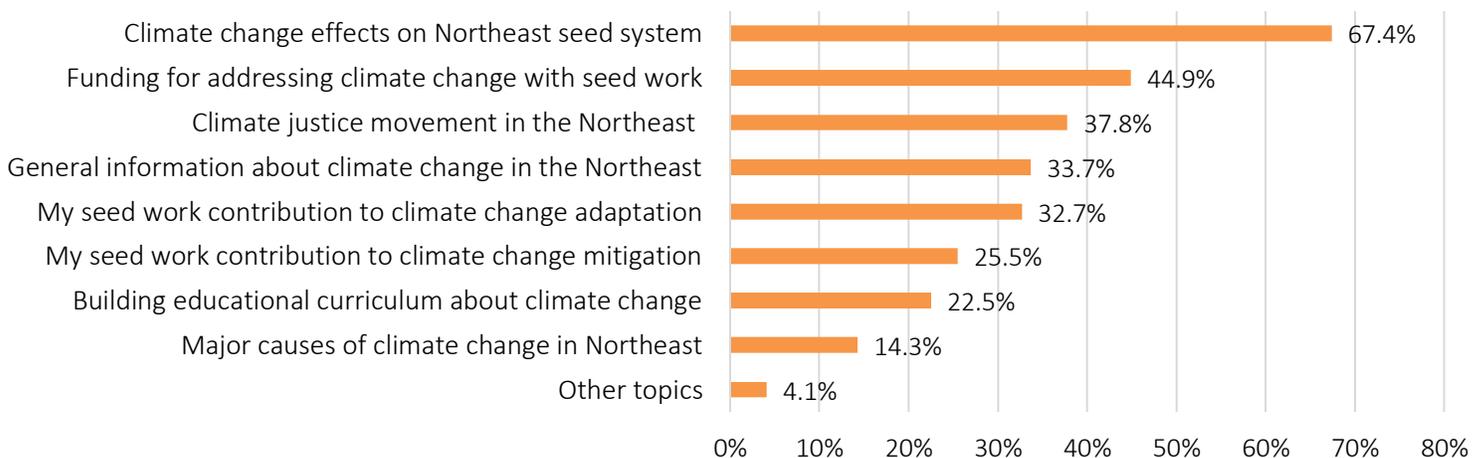
**Figure 18. Interest in topics related to distributing/selling seeds among survey respondents (n= 95)**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

identifying and claiming plants as “native” to the Northeast and sharing histories of seed stewardship and migration for different seeds.

During the needs assessment group sessions, one participant emphasized the importance of highlighting the origin of seeds on seed packets; the importance of breeding credit was especially prominent during plant breeding sessions; and seed rematriation was repeated in various instances across the conference from seed saving sessions to resilience building. Thus, these survey findings seem to reflect the different conversations already occurring in gatherings like the NOSC, which could point to the need for more convenings to have focused conversations on these topics alongside informational sessions on navigating regulations and other technical topics.

Interestingly, climate change was not a prominent theme during the conference sessions, although attendees and presenters occasionally tied the session topics to adapting to and mitigating climate change.

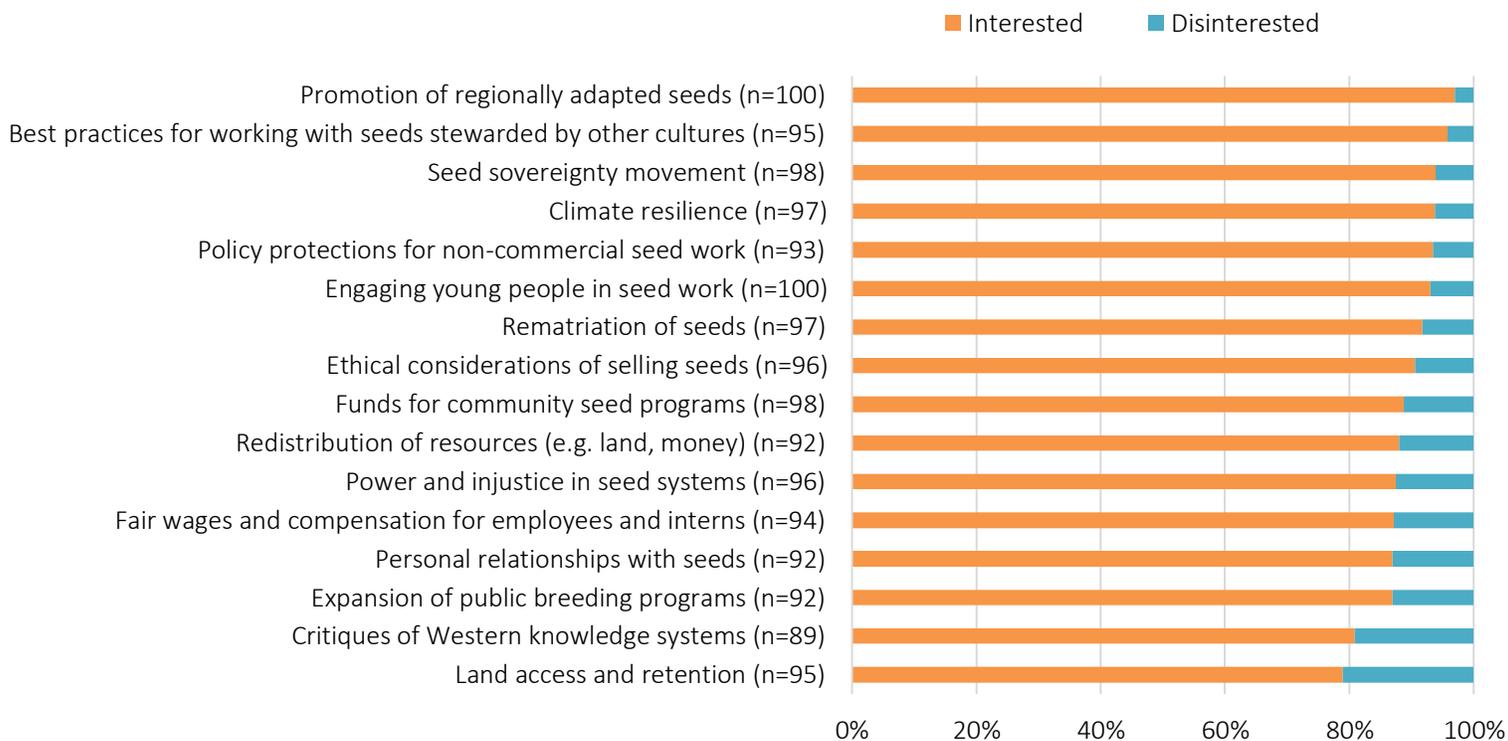


**Figure 19. Interest in topics related to climate change among survey respondents (n=98)**

*Note: Respondents were allowed to choose more than one response, so percentages do not add to 100%.*

Concerns around climate variability and pest management were raised, demonstrating how seed growers are attuned to the effects of climate change on their seed work, and solutions offered included enhancing biodiversity. Given the enormity of the challenge that climate change presents, the survey probed respondents to identify the topics related to climate change about which they would like to learn more (Figure 18). Respondents were most interested in a general understanding of how climate change impacts the Northeast seed system (67.4%), suggesting more dedication to the effects of climate change to the region would be welcome at future events. Due to the range and diversity of activities within the NOSS, climate change likely affects stakeholders differently, which might necessitate sector- and geographic-specific discussions. This also raises opportunities to understand how climate change affects other elements of the seed system beyond growing, such as processing and distribution across scales and stakeholders.

Respondents were also asked about their preferred methods of learning to better understand which kind of formats suit respondents for future programming and education efforts. Respondents (n=106) indicated that their top preferences for learning about seed-related content are: (1) manuals, books, and other printed materials (61.3%), (2) in-person demonstrations (60.4%), and (3) online presentations and webinars (50.9%). Respondents' (n=112) top three preferences for meeting others in the seed system included: (1) in-person workshops/classes (71.4%), (2) in-person events (conferences, networking, etc.) (71.4%), and (3) online workshop classes (36.6%). Given that learning and sharing about seed work were some of the most popular reasons among respondents for meeting others and that a high degree of interest exists in making new connections with others (see Networks and Connections), particular attention should be paid to these preferences of how interactions take place.



**Figure 20. Interest among survey respondents in topics for programming, workshops, organizing, and other initiatives**

*Note: Respondents were able to choose more than one answer, so percentages don't add to 100%.*

These survey findings around preferred learning materials and networking should inform programming that addresses respondents' priorities for learning topics (Figure 19). Respondents indicated high interest in promotion of regionally adapted seeds (97.0%), best practices for working with seeds from other cultures (95.8%), policy protections for non-commercial seed activity (93.6%), rematriation of seeds (91.8%), and the expansion of public breeding programs (87.0%). This degree of interest in these particular topics further underscore the importance of addressing governance issues in the NOSS and considering tensions that may exist between democratic and open access to seeds and cultural/communal claims to specific cultivars. Specifically, these conversations could jettison with discussions about seed sovereignty, a topic in which 93.9% of respondents indicated interest and one that explicitly engages in issues of control, power, and decision-making within seed systems. The high degree of interest across the topics listed in Figure 19 reflects an eagerness to improve and strengthen the NOSS from structural angles, such as legal regulations, public policies, and funding. Addressing these structural issues from multiple scales—the individual, the community, and the regional system—demands the development of long-term, regionally specific programs and initiatives that provide consistent support for seed workers in the Northeast across social, political, and ecological dimensions.

## DISCUSSION & FUTURE EFFORTS

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### NOSS STAKEHOLDERS ARE EAGER AND INTERESTED TO BUILD DIVERSE COMMUNITY AND NETWORKS

Commitment to building connections and reshaping community dynamics emerged at the conference and within survey results as necessary to improve inclusive access to resources. High degrees of interest in connecting with people of different racial/ethnic backgrounds, generations, locations and positions in the seed system implies an understanding that problem solving and strengthening the NOSS needs to be addressed with diverse coalitions and insights. However, a lack of connectivity between seed actors (e.g. respondents' lack of connections to plant breeders) indicates an area for improvement. Each of the stakeholder groups named in this assessment makes important contributions to the NOSS, and outreach to extend and strengthen partnerships across stakeholders could allow for greater sharing of resources and opportunities. Continuing to develop the social infrastructure and fabric of the NOSS may also be effective in mobilizing efforts to enhance the availability and accessibility of regionally adapted plants; engage in social/political movements pursuing sustainability; and share in the cultural meaning and histories of seeds. **However, efforts to expand and strengthen social networks in the region must dedicate particular efforts to inclusion, given that historically marginalized groups continue to be underrepresented (with conference participation and survey respondents providing evidence). Therefore, more opportunities to convene and engage with diverse ideas and expertise should be a priority for the immediate future.**

### THERE ARE ETHICAL DILEMMAS UNDERLYING SEED COMMERCIALIZATION AMONG STAKEHOLDERS

Issues of compensation, the labor market, and selling seeds posed a complicated ethical conversation for conference attendees. As evidenced by survey data, few respondents indicated that they sell seed while conference attendees expressed challenges in accessing financial resources, including for non-commercial seed activity. At the same time, respondents indicated a dependence on seed companies for resources or support. This degree of reliance might explain the complicated ethical conversations surrounding the responsibilities of

seed companies during the conference. These discussions paint a picture of the different ethical considerations around commercializing seed, fair contracts, and labor dynamics that participants struggle to reconcile, especially since the stakes include potentially exacerbating barriers for beginning and limited resourced seed workers. Seed companies serve an essential role to the NOSS and should also consider expanding their existing opportunities around funding and contracts to seed growers in the Northeast. **Existing and future seed companies should pay close attention to these ethical dilemmas as they develop their operations, missions, and relationships with other stakeholders. The reliance on seed companies among survey respondents also prompts consideration of other sources of resources from entities like universities, state/federal programs, and philanthropic organizations that should focus on supporting diverse seed work that extend beyond the conventional activities in the formal seed system like plant breeding and seed commercialization.**

### **LACK OF TIME AND FUNDING WERE GREATEST OBSTACLES FOR RESOURCE ACCESS**

Lack of time and lack of funding were the primary obstacles experienced by respondents, which is present in both formal and informal systems, as corroborated by conference attendees. Most of the survey respondents were community-based seed workers, home-based seed workers, and commercial growers, all of whom except the latter are involved in seed work likely as a hobby or volunteer work. For those who are involved on a volunteer basis, attending conferences or tending to their jobs is likely a challenge due to lack of time or financial compensation. On the other hand, commercial growers and people involved in seed companies at the conference were concerned with funding their operations, ensuring profitability, and scaling up. **As a result, it is worthwhile to orient future action around securing funding (for both commercial and non-commercial seed work), supporting undercompensated seed workers, and continuing to develop and widely distribute materials that support ethical business plans.**

### **INFORMATION AND INPUTS ARE MOST ACCESSIBLE TO RESPONDENTS**

The most accessible resources for respondents were information related to growing, processing, and harvesting seeds as well as agricultural inputs—all of which are more readily available than the other resources listed like funding or legal advice, likely due to the diverse and relatively cheaper ways of accessing information and inputs as opposed to the relatively higher barriers in accessing legal support. However, this raises questions as to whether information and inputs were already accessible to respondents prior to their involvement in seed work or whether information and inputs were comparatively more accessible than other resources to those new to agricultural work. The answers to these questions have implications for the growth of organic seed activity; in order to usher more people and excitement around organic seed work, supporting those who are unfamiliar with agricultural work and without pre-existing resources is important to diversifying and expanding the reach of organic seed work. At the same time, survey findings and conference attendees' responses indicate that there is a need for more education and sharing around growing specific and diverse plants that are not commonly grown or utilized in the Northeast region. **Thus, respondents' and conference attendees' desire to support marginalized seed workers should also translate to the recognition and support of a wide range of knowledge sources, which should include funding to support diverse knowledge-bearers who steward less commonly grown crops that are important to the cultural fabric of the Northeast.**

## THE NOSS COMMUNITY IS INTERESTED IN PROGRAMMING ADDRESSING BOTH TECHNICAL EDUCATION AND SOCIAL /POLITICAL TOPICS

For those who struggle with accessing information relevant to their work, technical education (seed characteristics, tool usage, etc.) are important topics for respondents. In addition, cultural histories and practices around seeds, climate justice work, legal regulations, and seed rematriation are a few of the many social and political topics that respondents expressed high levels of interest. **Collectively, these interests point to a need to consider seed systems comprehensively, including its ecological, biological, social, cultural, economic, and political dimensions. In particular, a need exists to engage in governance mechanisms within the region to negotiate how decision-making and control over seeds functions in ways that are socially just and respectful of different relationships and cultural traditions around seeds.**

## RESPONDENTS FEEL EMPOWERED IN THEIR WORK AND THEIR IMPACTS IN THE NOSS

Although respondents are divided in their confidence around their ability to impact policy and achieve profitability, they nonetheless feel that they are able to self-determine the goals and practices of their seed work. Many also agree that the NOSS performs well in many areas, such as innovation, environmental stewardship, and meeting consumers' interests, indicating an optimistic perspective of the NOSS. Again, these findings are complicated by the perspectives shared by some people of color who attended the NOSS, who continue to experience marginalization and exclusion. **Difficult, uncomfortable, and honest conversations will be necessary to navigate dynamics of inclusion and exclusion in ways that explicitly recognize injustices and pathways to remediate them.**

## CONCLUSION

While these findings represent a limited sample of the NOSS, they nonetheless describe a seed system with active, eager, and mission-driven participants invested in the wellbeing of this system. And, importantly, survey respondents and conference attendees understand the importance of forging stronger and diverse relationships as a pathway to building a resilient seed system. There are certainly several areas of concern that require urgent and focused attention— for example, the exclusion of marginalized/limited resourced seed workers, limited circulation of financial resources, and somewhat disconnected networks. At the same time, these findings also demonstrate that respondents are interested in a variety of practices that address marginalization and exploitation of seed workers and a willingness to engage with new ideas and concepts. This interest, coupled with a focus on regionally adapted seeds and genetic diversity, points to attitudes that are suited to making strides in the sustainability and democratization of the NOSS. While this strong collaborative spirit should be threaded with careful reflections around power dynamics and positionality, there are many opportunities within the NOSS that allow for justice-oriented change and collaborations.