

Seed Sourcing for Restoration in a Changing Climate

I had the opportunity to attend a Seed Sourcing Symposium at the Chicago Botanic Gardens on June 13. It was an important meeting and just the beginning of a very important discussion. The meeting moved from historical aspects of seed sourcing to current day projects to needed future actions. As promised, the day led to more questions than answers. I was surprised to learn organizations, government entities, and large institutions were focusing and directing resources to this topic. I'll provide some highlights from the speakers. Check out the [Native Seed and Plant Sourcing](#) paper for indepth information on this topic.

Seed sourcing is the process of deciding which native seeds or plants will germinate and survive where you are planting them.

Historically, the native seed zones were created to limit movement of seeds; the goal was to prevent genetic maladaptation. When compared to current climate data, the 1960-1990 data used to create these maps is showing measurable differences. Climate change is happening quicker than we expect. The result is expected to be increases in extremes; for example, heat waves are expected to increase by 60% and increase in duration. Perhaps we need dynamic seed zones rather than the current static ones. Some work has been done to create provisional seed zones for the western part of the U.S.

What used to be "how local is local" has changed to "is local still local." Speakers stressed the need to think ecologically when choosing species and sources. Latitude is an important component of ecologically-relevant seeds, especially as we consider climate change, which cannot be ignored.

Can we rely on adaptive evolution to rescue our wild populations from climate change? Can pollinators keep up with flowering evolution? Research is being done using trees in the northwest but we were cautioned that one species example cannot be extrapolated to another.

Commercial native seed companies were represented. They expressed a need for scientific evaluation of seed genetics. At present, their source identification is on the honor system. Native seed is not sold based on genetic standards; it is seed collected from native populations where no genetic testing of parent material has been conducted. It was emphasized that we are not able to genetically pinpoint a species. There is no historical genetic data on plants. We know genetic material is moved about via insects; we also know it is moved by bacteria and fungi.

Jack Pizzo, a commercial seed producer, used the analogy of Dr. Frankenstein to describe our current restoration practices. We take all these disparate parts with huge variability and put them together to recreate an ecosystem. These puzzle pieces are not static nor are they well studied. What is science and what is opinion when specifications of provenance for projects are written for commercial suppliers? Supply and demand must be considered. Is the demand for certain provenance, which may or may not be “genetically appropriate” keeping up with the economic realities?

A couple of presenters encouraged folks to “poke holes” in current practices. Not as a way to negatively criticize but as a way to “make it better.” Playing devil’s advocate and rethinking restoration practices is imperative and should be encouraged. Nature isn’t static. Nature doesn’t have a rote schedule. Neither should we.

The Bureau of Land Management (BLM) has established a National Seed Strategy for Rehabilitation and Restoration; the success of this is based on “a nationwide network of native seed

collectors”—from private individuals to organizations. The ultimate goal is to preserve our native seed stock and develop driven seed zones for each plant and tree which can be used for seed transfer. Our current use of serendipity rather than strategy backed with scientific evidence will not create resilient ecosystems. “We need the same forward-thinking management we demand for other natural resources such as timber and oil,” states Peggy Olwell, BLM.

While the BLM has initiated the first steps to preserve and protect our native seed sources, they readily admit that making sure the “right seed is in the right place at the right time” is the responsibility of the practitioner. And gaps in getting the information from the scientific community to the practitioner cannot be denied.

Projects already initiated:

- [Natural Selections](#) – The Natural Selections Program develops high quality, genetically diverse, regionally adapted native seed for prairie and wetland restorations.
- [Prairie on Farms](#) – Tallgrass Prairie Center has begun a new project to share knowledge of prairie reconstruction and management techniques with rural landowners.
- [National Seed Strategy](#) – Their mission is to ensure the availability of genetically appropriate seed to restore viable and productive plant communities and sustainable ecosystems.
- Seed Zone Summit – The northeastern area of the Forest Service will be holding this summit in 2017 to develop seed zones, develop guidelines for their use, and define terminology. The date and location are to be determined.
- Nature Serve has created a [Climate Change Vulnerability Index](#) to identify plants and animals most vulnerable to climate change

Some needs that were discussed:

- Commercial seed producers need to unite and create a native seed organization that represents the interests of those producing, sourcing, and planting native seeds. At present, there is no political voice or educational component for this industry.
- We need direct funding for plants in our federal, state, and local budget. The BLM has no direct funding for plants at present.
- We need educational forums to connect the science to the practitioner. This is often lamented in restoration but was specifically noted with regard to seed sourcing and understanding of “genetically appropriate” plant materials.