

BUILDING BRIDGES BETWEEN AGENCIES, RESEARCHERS, FARMERS AND NON-GOVERNMENTAL ORGANIZATIONS TO CREATE COLLABORATIVE NATIVE SEED PROGRAMS

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Abstract: The Native Plant Materials Development Program was authorized by the U.S. Department of the Interior and Related Agencies Appropriations Act of FY2001 to provide support for development of native plant materials required for restoration of disturbed public lands in the U.S.A. The Washington, DC, Office of the USDI Bureau of Land Management has provided national leadership for this program by developing partnerships with more than 250 public and private entities, a national program for collecting germplasm for ex situ conservation and for seed increase for restoration uses, and by initiating state and regional level native plant materials programs. Regional programs such as the Great Basin Native Plant Selection and Increase Project aim to fulfil long-term plant material needs by providing genetically diverse, regionally appropriate seed sources and fostering the research required to produce seeds of new restoration species in agricultural settings. The Deschutes Basin Native Plant Seedbank, a non-profit organization, has provided valuable leadership by functioning as a buyer's cooperatives to provide affordable local seed for public and private partners in areas with a mosaic of land ownerships. At all levels, native plant materials development programs rely heavily upon cooperation among land managers, researchers, non-governmental organizations, and the private sector seed industry.

Keywords: climate change, disturbance by fire, invasive species, native plant programs

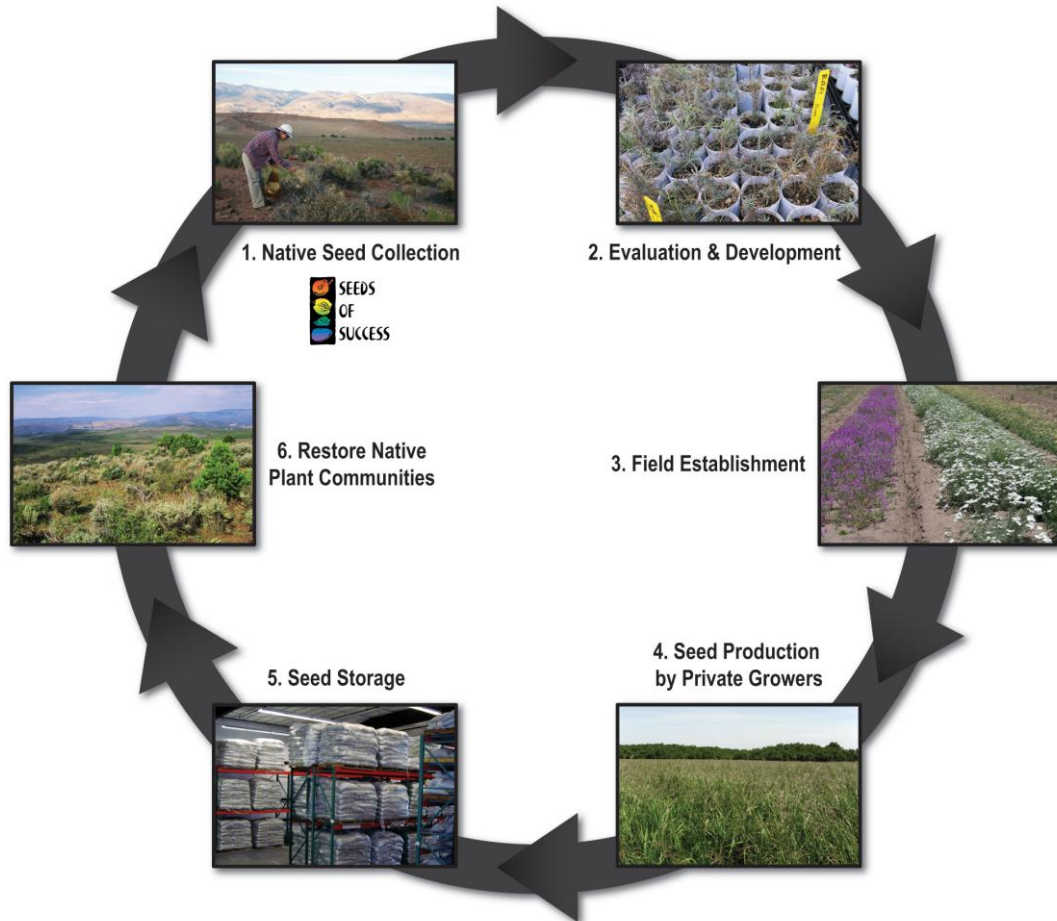
Introduction

The Native Plant Materials Development Program (NPMDP) in the United States was authorized by the U.S. Department of the Interior and Related Agencies Appropriations Act of FY2001. A Report to Congress (USDI & USDA 2002) provided recommendations and strategies for development of this program for the more than 182 million ha of lands managed by agencies of the U.S. Department of the Interior and U.S. Department of Agriculture. The mission of the national program is to “ensure a stable and economical supply of native plant materials for rehabilitation and restoration needs” and to “facilitate the development of a long-term program to supply and manage native plant materials for use on public lands” (USDI & USDA 2002). Key considerations for program success emphasized public and private sector partnerships; support for federal, state and Tribal native plant material development and production, research, and seed storage facilities; and education and outreach to the general public. NPMDP implementation at federal, regional and local levels since its inception and the innovation required to accomplish its goals illustrate the essential roles of cooperation and communication amongst all players (USDI BLM 2009) (Fig. 1).

Methods and Results

The U.S. Department of the Interior's Bureau of Land Management (BLM) national NPMDP staff provides coordination among federal agencies and more than 250 partners through the Plant Conservation Alliance (USDI BLM 2009). Partners include government agencies, non-governmental organizations, university researchers, restoration practitioners, and the private sector native seed and plant industry. Partners provide technical assistance, public education, in-kind contributions, and seed and plant increase. The federal level NPMDP also provides leadership for the Seeds of Success Program, which was initiated in partnership with the Millennium Seed Bank of the Royal Botanic Gardens at Kew, U.K. in 2001 (USDI BLM 2010). This program provides for collection of native germplasm from across the United States through collaboration with botanic gardens, offices of the BLM and other agencies, and teams of interns. To date, accomplishments of this program include more than 10,000 seed collections plus training and field experience for more than 1,500 college graduates. Seed samples of each species collected are stored at Kew. Samples from each collection are placed in long-term storage with the USDA Agricultural Research Service (ARS) National Plant Germplasm System in Fort Collins, Colorado and in the working collection at the ARS facility at Pullman,

Washington. Samples at the later location are available to researchers worldwide. The remaining portion of each collection provides local material that can be used immediately for restoration projects or increased through contracts with private growers.



The Washington Office of the BLM also provides funding and support for state- and regional-level native plant material development programs (USDI BLM 2009). State-level programs encourage collection and increase of local plant materials through contracts with private sector seed growers; development of seed storage facilities; and interaction with Tribes, other agencies, private industry and the general public. Programs have evolved with differing staffs and objectives depending upon their location and associated restoration issues, thus the nature of the plant materials required and associated partnerships developed varies. Emphases can include riparian or wetland protection, post-fire seeding, invasive species control, riparian or wetland protection, watershed stabilization, and combinations of these and other targets.

Regional programs are being initiated to focus on long-term development of plant materials for specific biogeographic areas. Over the last decade seven of these programs have been organized to serve lands managed by the BLM (Peppin 2010; USDA FS 2010; USDI BLM 2009; USDI BLM Utah 2009). The aim of these programs is to provide regionally appropriate plant materials of key restoration species that are locally adapted and genetically diverse. The Great Basin Native Plant Selection and Increase Project (Shaw et al. 2005; USDA FS 2010) was one of the first regional programs established. The approach of this and other projects has been to develop materials from pooled sources collected within Omernik ecoregions (Omernik 1987) or

other areas delineated by environmental variables such as total or seasonal precipitation, seasonal temperature patterns, soils, elevation, and latitude. These materials can be increased and used on restoration sites within these provisional seed zones to provide some assurance that the materials will be pre-adapted and include the diversity required for changes in climate and environmental conditions (Johnson et al. 2004, 2010; Withrow-Robinson & Johnson 2006) . The more intense and time consuming approach of genecological research utilizing common gardens to develop species-specific seed zones as has been done for forest tree species is being followed for several important Great Basin species (Adair et al. 2006; Erickson et al. 2004; Shaw & Pellant 2010). Outcomes of both approaches provide managers with options for increasing materials that can be used across specific seed zones rather than within areas delimited by individual field offices or other political boundaries. These approaches also increase market stability for growers. They require collaboration among seed certification agencies, restorationists, wildland seed collectors, and seed growers to adapt the evolving pre-variety germplasm certification system to accommodate seed zones, certification of wildland collections, and agricultural increase of pooled materials (Young et al. 2003).

The Great Basin Native Plant Selection and Increase Project and other regional native plant materials development programs also foster the research required to produce seed of native grasses and herbs. It is generally not feasible to harvest the required quantities of seed from wildlands due to the magnitude of disturbances, unreliable seed production on the semi-arid and arid lands managed by the BLM in the Great Basin, the prevalence of invasive species within native populations and, particularly in the case of native herbs, small population sizes. Thus for new restoration species, it is necessary to determine barriers to successful seed production in agricultural fields and to conduct the research required to overcome these barriers. Researchers with a variety of agricultural expertise, including seed technology, field cultural practices (weed control, stand establishment, irrigation), pest identification and management, and pollinator requirements, participate to provide species specific seed production protocols for growers (Cane 2008; Shock 2010). In addition, experienced growers often contribute to the solution of problems associated with production of new restoration species.

Non-governmental, non-profit organizations such as Deschutes Basin Native Plant Seedbank have proven effective alternatives to agency-directed programs for stabilizing seed supplies in areas characterized by mosaics of land ownership (Deschutes Co., Oregon 2010; Youtie 2008). Many local agency offices, non-profit organizations and private land owners do not have the staff, expertise or facilities for harvesting wild seed for increase. Thus genetically appropriate seed for mixed ownership areas is rarely available and often expensive. The Deschutes Basin Native Plant Seedbank is a non-profit organization formed to collect, propagate, store and provide local seed of common restoration species to more than 20 partners, including the BLM. These include federal, state, and local agencies; non-profit organizations; Tribes; and private companies and landowners conducting rehabilitation and restoration projects in the Deschutes Basin of central Oregon. The Seedbank collects, propagates, stores and provides local seed of common restoration species to its partners. It secures funding through state and federal grants, donations, and seed sales; coordinates contracts with growers; distributes the seed; and facilitates cooperation between formal partners and other users of the seedbank. All available seed has been sold each year. The Seedbank and its partners provide educational opportunities for members, land managers, property owners, and the public on seeding strategies for native species and the benefits of native plant communities.

Conclusions

The Native Plant Materials Development Program has fostered native plant programs at all levels within the U.S. Department of the Interior and U.S. Department of Agriculture as well as

by non-governmental organizations. The aim of these programs is to provide restoration materials that include the genetic variability required for adaptation to changing environmental conditions. Although much progress has been made, increased collaboration and communication among public and private land managers, restorationists, researchers, and private seed and plant growers is essential to meet new challenges that arise as these programs progress.

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