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Growing the Future of Prairie Restoration: Building a Resilient Native Seed Industry in Western Canada

Renny W. Grilz, PAg (Dist.)
2024 Nuffield Canada Scholar

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LAND ACKNOWLEDGEMENT

This Nuffield Canada Scholarship research was shaped by experiences across many landscapes, but it is rooted in the prairie grasslands of what is now called Saskatchewan. I respectfully acknowledge that these lands are the traditional territories of the Cree, Saulteaux, Dakota, Lakota, Nakota, Blackfoot, and Métis Peoples.

Indigenous Peoples have stewarded seeds, soils, fire, and grasslands since time immemorial. Their knowledge systems, relationships with place, and responsibilities to the land continue to inform how we understand resilience, restoration, and ecological balance.

I also recognize that agriculture has profoundly shaped the prairies over the past two centuries, carried forward by settler families including my own ancestors who arrived from Austria, Germany, Holland, Hungary, Ireland, Ukraine, and the United States. Their labour, livelihoods, and relationships with the land became part of this landscape's history, bringing both opportunity and impact.

This work is offered in the spirit of reconciliation and responsibility, acknowledging that today's conservation, restoration, and agricultural practices must learn from intergenerational knowledge, honour Indigenous knowledge systems, and work toward shared stewardship of prairie landscapes for future generations.

SCHOLAR PROFILE

Renny W. Grilz is a Professional Agrologist, grassland ecologist, and native seed producer with more than 30 years of experience in prairie conservation, ecological restoration, and land stewardship across Western Canada. Based in Aberdeen, Saskatchewan, Renny and his wife, Lisa, operate Blazing Star Wildflower Seed Company, a family-run business founded by his parents in the early 1990s as a farm-diversification initiative. The company focuses on the production of native wildflowers and grasses for ecological restoration, pollinator habitat, and urban greening.

Figure 1. Renny and Lisa Grilz with Blazing Star Wildflower Seed Company at their farm near Aberdeen, SK

Renny's connection to prairie landscapes began in high school under the mentorship of Dr. Jim Romo at the University of Saskatchewan and through his Honours Degree in Plant Ecology. His career has consistently bridged agriculture and ecology, with a focus on grassland conservation, range management, biodiversity enhancement, native seed systems, and prescribed fire. He has worked with Ducks Unlimited Canada, Nature Conservancy of Canada, and Canadian Wildlife Service, contributing to conservation initiatives across all three Prairie Provinces.

Since 2015, Renny has worked with the Meewasin Valley Authority in Saskatoon, where he currently serves as Director of Conservation, leading programs in prescribed fire, targeted grazing, invasive species management, ecological restoration, and long-term ecological monitoring. He is a founding member of the Canadian Prairies Prescribed Fire Exchange, the Native Seed Producers of Canada, and the Manitoba–Saskatchewan Native Seed Collaboration, and has contributed to numerous regional and national committees, including the Society for Range Management, the Saskatchewan Prairie Conservation Action Plan, and the Saskatchewan Association of Watersheds.

In recognition of his contributions to prairie stewardship and agriculture, Renny received both the Prairie Conservation Award and the Distinguished Agrologist Award in 2023. As a 2024 Nuffield Canada Scholar, his research focused on strengthening the native seed industry in Western Canada and advancing seedbanking strategies as foundational infrastructure for large-scale restoration. His travels across Brazil, Europe, and North America examined coordinated seed systems, restoration policy frameworks, and public–private models that support resilient, producer-led restoration economies.

Renny's work combines scientific expertise with hands-on practice and a deep commitment to prairie landscapes. When not travelling or collaborating with partners, he can be found tending native seed production plots, leading field-based training and tours, lighting prescribed fires, and mentoring the next generation of conservation and land management professionals.

ACKNOWLEDGMENTS
I am deeply grateful to Nuffield Canada for the opportunity to pursue this life-changing scholarship. The guidance, community, and global perspective offered through the Nuffield experience have profoundly shaped both my professional outlook and personal growth.

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I would like to acknowledge the late Art Westlund, Nuffield Scholar (1979), for introducing me to the Nuffield community early in my career and planting the seed that later grew into this remarkable journey. Your mentorship and belief in the power of shared knowledge was instrumental in setting me on this path. To my friends, colleagues, and coworkers, thank you for your encouragement, insights, and flexibility throughout this process. To the many people who followed and supported my journey through conversations, visits, and social media, your encouragement and shared enthusiasm helped sustain my energy and motivation.

Finally, I offer my deepest thanks to my father, Leon, and my late mother, Mary Grilz, who founded Blazing Star Wildflower Seed Company more than 30 years ago. Their vision and dedication to native plants laid the foundation for everything I do. I know my mother would be incredibly proud; her spirit has been with me every step of the way.

This report is the product of countless conversations, open doors, shared meals, and generous exchanges across borders and communities; far too many people to thank individually. To everyone who took the time to share their knowledge, experience, and stories with me: *Go Raibh Míle Maith Agat*! *Vielen Dank*! *Aitäh*! *Paldies*! *Obrigado*! *Thank You*!

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In-kind support was instrumental throughout my travels and study. I extend thanks to the Canadian Prairies Prescribed Fire Exchange, Lonesome Dove Ranch, Meewasin Valley Authority, One School One Farm Shelterbelt Project, Pollinator Paradise YXE, Saskatchewan Prairie Conservation Action Plan, Saskatoon Farmers' Market, and the Saskatoon Nature Society for their collaboration, resources, and encouragement throughout the course of my scholarship. I am appreciative of the broad network of supporters; organizations, businesses, and individuals who believed in the value of this work and contributed to its success.

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EXECUTIVE SUMMARY

Native prairie is one of the most endangered ecosystems in the world, with less than 20% remaining intact in Western Canada and less than 16% in Saskatchewan. Large-scale ecological restoration is now central to meeting Canada's biodiversity, climate, and reconciliation commitments. Success will depend on a reliable supply of ecologically appropriate, provenance-based native seeds yet Canada lacks a coordinated national seed strategy, a seedbanking network, or procurement frameworks that ensure Canadian-grown native seed is prioritized.

This Nuffield Canada research project examined how Canada can build a resilient native seed industry by expanding production capacity, developing prairie-focused seedbank infrastructure, and embedding supportive policies, standards, and partnerships. The study included field visits, producer interviews, and conferences across Europe and the United States. International models consistently showed that stable native seed systems are built on five pillars:

1. **Producers at the center:** supported by training, infrastructure, foundation seed, and long-term procurement contracts.
2. **Seedbanks as active partners:** conserving genetic diversity while supplying foundation seed and rare species to growers.
3. **Policy and procurement frameworks:** embedding native seed use into regulations, standards, and restoration targets.
4. **Diversified markets**: expanding beyond restoration to include regenerative agriculture, pollinator habitat, Indigenous stewardship, and urban greening.
5. **National coordination**: building strong producer networks, regional hubs, and cross-sector collaboration.

Canadian surveys and strategies confirm persistent challenges: inconsistent demand, shortage of foundation seed, limited mechanization, and fragmented markets. There are fewer than 50 dedicated native seed producers in Western Canada, most operating at small or part-time scale. Despite this, momentum is growing. Initiatives such as the Native Seed Producers of Canada (NSPC), Southern Alberta and Manitoba–Saskatchewan Native Seed Collaboratives, WWF-Canada's Native Seed Orchard Program, and the Meewasin Seedbank Project demonstrate how partnerships can begin to close gaps. However, without coordinated investment and national policy, Canada will remain dependent on imported or non-local seed, undermining both ecological outcomes and rural economic opportunities.

Strategic Priorities

To close the gap between restoration ambition and seed supply capacity, this report identifies five priority actions:

1. **National policy action:** Develop a Canadian National Native Seed Strategy with regional implementation, provenance-based seed zones, and mandatory use of Canadian-grown seed in publicly funded restoration projects.
2. **Infrastructure and market investment**: Fund seed cleaning, processing, storage, and viability testing facilities, while expanding mechanization, mentorship, and training for producers.
3. **Producer networks:** Strengthen and resource the Native Seed Producers of Canada (NSPC) and regional hubs to align production with ecological priorities and support new entrants, including Indigenous producers.
4. **Seedbank integration**: Establish a prairie-focused seedbank network that safeguards genetic diversity, supplies foundation seed, and supports rare and culturally significant species.
5. **Market diversification:** Expand beyond ecological restoration into regenerative agriculture, pollinator programs, ESG (environmental, social, and governance) investment, Indigenous stewardship, urban greening, and climate-resilient landscaping.

Call to Action

Canada has a narrow but critical window to act. Native seed producers are already demonstrating leadership, but cannot scale without supportive infrastructure, stable demand, and coordinated policy. By centering on producers, linking seedbanks to supply chains, and embedding native seed in biodiversity and climate frameworks, Canada can build a resilient, ecologically sound, and economically viable native seed industry.

Investing in native seeds is not only about restoration; it is about securing biodiversity, advancing reconciliation, strengthening rural economies, and building climate resilience. This represents a generational opportunity to align these national priorities by investing in the farmers and systems that grow Western Canada's native seed.

Figure 2. From Insight to Action: A Framework for Western Canada's Native Seed Industry.

DISCLAIMER

This report has been prepared in good faith, but is not intended to be a scientific study or an academic paper. It is a collection of my current thoughts and findings on discussions, research and visits undertaken during my Nuffield Canada Scholarship.

It illustrates my thought process and my quest for improvements to my knowledge base. It is not a manual with step-by-step instructions to implement procedures.

Neither Nuffield Canada, nor my sponsor, nor any other sponsoring body guarantees or warrants the accuracy, reliability, completeness or currency of the information in this publication or its usefulness in achieving any purpose. Readers are responsible for assessing the relevance and accuracy of the content of this publication.

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Figure 3. The Diversity of our Saskatchewan Native Wildflower Seeds (Photo Credit: Meewasin Valley Authority).

1.0 INTRODUCTION

"Without the right seed, in the right place, at the right time,
it's not restoration—it's landscaping."
— Peggy Olwell, Plant Conservation & Restoration Program Lead (retired),
U.S. Bureau of Land Management (BLM)

This statement underscores the central challenge in ecological restoration: the critical need for appropriate native seeds. In Canada's prairies, native seed supply remains one of the most significant bottlenecks limiting the success of habitat restoration, biodiversity recovery, and climate adaptation initiatives. While interest in prairie restoration is growing, driven by public policy, species-at-risk legislation, grazing production, and Indigenous-led conservation, access to ecologically appropriate native seed remains unreliable, under-supported, and uncoordinated.

Native seed production should be recognized as a form of agriculture. Like other farming sectors, producers prepare land, manage crops, harvest, clean, and store seed, while maintaining ecological appropriateness and genetic integrity. Recognizing native seed as an agricultural product would enable access to research, infrastructure, and policy supports essential to strengthening the supply chain.

Beyond restoration, native plants are finding new and diverse roles. There is increasing recognition of their potential in pollinator habitat creation, regenerative agriculture, cultural revitalization, climate-resilient landscaping, food and medicinal products, nature-based solutions, and green infrastructure. With the right investment and vision, Canada's native plant economy could evolve to serve not only environmental goals, but also economic diversification and rural development. This report explores both the systemic changes needed to scale the native seed supply chain and the new opportunities that could redefine the value of native plants.

1.1 Status of Western Canada's Prairie Grasslands

The prairie grassland biome of southern Alberta, Saskatchewan, and Manitoba is among the most threatened ecosystems in North America (Scholtz and Twidwell, 2022). Less than 20% of native prairie remains intact across the region (Hammermeister et al., 2001). Losses are most severe at the provincial scale, with Saskatchewan retaining less than 16% of original prairie and southeastern Manitoba less than 1% of its Tallgrass Prairie (Saskatchewan Ministry of Environment, 2025; Sveinson, 2003).

Prairie grasslands face ongoing threats from invasive species, woody encroachment, agricultural and urban expansion, industrial development, altered grazing regimes, and fire suppression (Sawatzky, 2019). The ecological consequences are profound. Fragmentation reduces habitat connectivity, invasive species alternative plant communities, and land conversion disrupts soil health, pollination, and carbon storage. Restoration is therefore not optional, but essential to halt

biodiversity loss, sustain Indigenous cultural relationships, and maintain prairie resilience under climate change.

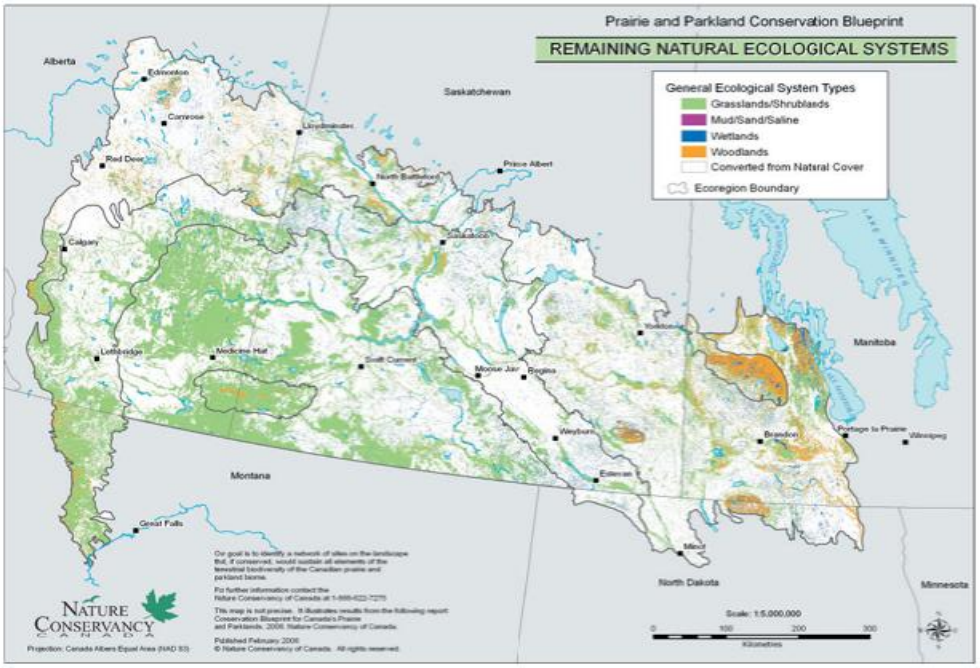

Figure 4. Remaining Natural Ecosystems in Canada's Prairie and Parkland Ecosystems (Riley et al., 2007)

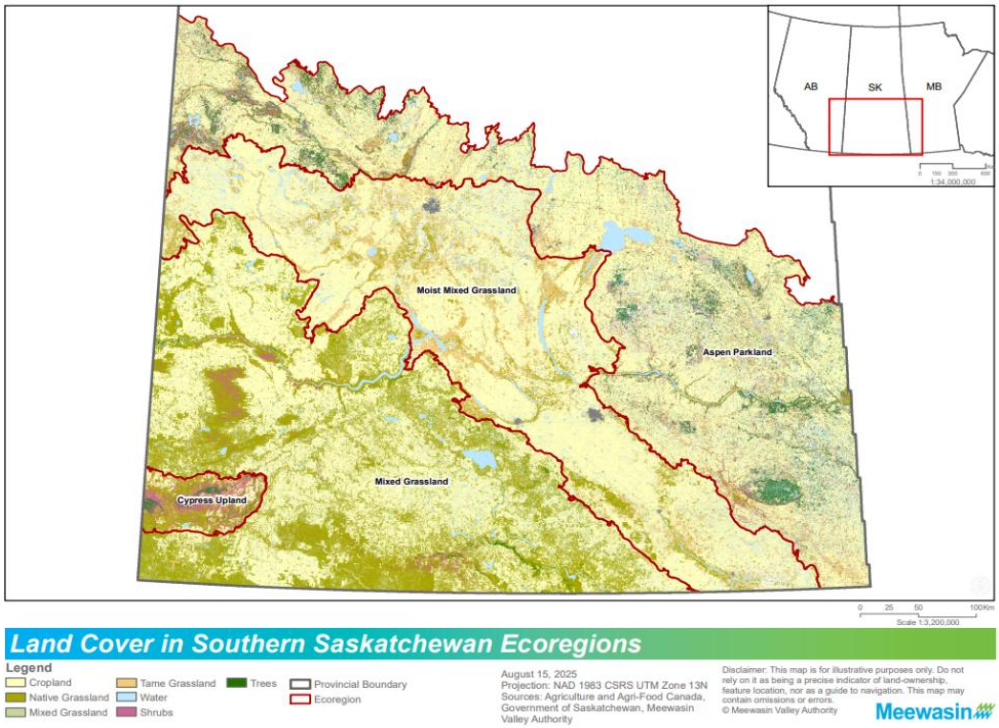

Figure 5. Remaining Grassland and Parkland Communities in Saskatchewan (data source: Prairie Land Inventory of Saskatchewan, 2024)

1.2 What is Ecological Restoration

Ecological restoration is the process of assisting the recovery of ecosystems that have been degraded, damaged, or destroyed, with the goal of re-establishing their ecological integrity, biodiversity, and long-term resilience (Clewell et al, 2002). It often involves restoring natural processes such as fire, grazing, flooding, and pollination that maintain ecosystem structure and function. For prairie and grassland systems, this can include prescribed fire to reduce woody encroachment, targeted grazing to manage invasive plants and promote diversity, and hydrological restoration to reconnect wetlands and riparian areas. Restoration is not simply planting species; it is about rebuilding the processes that allow ecosystems to be self-sustaining over time.

Seed-based ecological restoration is a subset of restoration that focuses on the use of native plant seeds to re-establish species composition, genetic diversity, and ecological function (Pedrini and Dixon, 2020). It ensures that the right species, from the right provenance, are introduced to create plant communities that are resilient and adapted to local conditions. When combined with natural processes like fire and grazing, seed-based restoration provides the foundation for long-term recovery by establishing plant communities that can interact with soils, wildlife, and disturbance regimes. In short, native seeds supply the building blocks (genetic material) that natural processes then shape into a functioning ecosystem.

A functioning native seed industry underpins restoration efforts, from riparian buffers to livestock pastures to pollinator habitat and urban greening. Unlike conventional crops, native seed production is low-volume, technically complex, and requires specialized equipment, long-term investment, and coordination which are conditions largely absent in Canada's fragmented native seed sector.

1.3 Western Canada's Native Seed Industry Overview

Globally, native seed systems are evolving from informal, project-based supply chains into structured, policy-driven industries that underpin large-scale ecological restoration. International experience demonstrates that strategic investment, clear regulation, and coordinated producer networks are essential to securing reliable supplies of ecologically appropriate seed while supporting rural economies and restoration outcomes.

In Europe, native seed production is tightly embedded within biodiversity policy and regulatory frameworks. Germany's *Regiosaatgut* system legally requires provenance-based native seed for most restoration projects, creating a stable, predictable market for producers while safeguarding genetic integrity. This approach is reinforced by the European Union's 2024 Nature Restoration Law, which establishes legally binding restoration targets across Member States. Producer-led organizations such as the European Native Seed Producers Association (ENSPA) and Germany's Verband deutscher Wildsamen- und Wildpflanzenproduzenten (VWW) play a critical role by setting quality standards, administering certification, and linking producers directly to policy and

procurement processes. Together, these mechanisms demonstrate how legislation, standards, and producer coordination can professionalize the native seed sector and scale restoration capacity.

In the United States, the National Native Seed Strategy, launched in 2015 and renewed in 2021, provides a comprehensive framework linking native seed supply to federal priorities such as wildfire recovery, pollinator habitat, biodiversity conservation, and climate resilience. Provisional seed transfer zones guide the use of genetically appropriate material, while integrated programs such as Seeds of Success, the Native Plant Materials Development Program, and the National Plant Germplasm System connect seed collection, research, banking, and commercial production. Regional partnerships including the Willamette Valley Native Plant Partnership, the Southwest Seed Partnership, and the Northeast Seed Network align production with ecological priorities at landscape scales. Sustained federal leadership, long-term investment, and strong networks have positioned native seed as critical national restoration infrastructure, offering practical models that Canada could adapt.

By contrast, Canada's native seed sector, particularly in Western Canada, remains fragmented, informal, and under-supported, despite growing commitments under the Kunming–Montreal Global Biodiversity Framework, the Bonn Challenge, and Canada's 2030 Nature Strategy. Canada lacks a national native seed strategy, consistent provenance standards, formal seed zoning for most prairie species, and long-term procurement policies that would provide market stability. As a result, demand remains inconsistent and producers face significant uncertainty when making long-term investments.

Over the past 15 years, multiple assessments including the Alberta Market Assessment (Woosaree, 2010), the Native Plant Market Assessment (Native Plant Society of Saskatchewan, 2024), the Southern Alberta Native Seed Collaborative Survey (Powter & Smreciu, 2025), and the Native Seed Strategy for Restoration in Manitoba (Murray et al., 2025) have consistently identified the same barriers: insufficient production capacity, lack of foundation seed, inconsistent demand, limited infrastructure for cleaning and storage, and the absence of clear provenance and quality standards. Despite repeated recommendations, many of these gaps remain largely unaddressed.

Current data suggests that fewer than 50 dedicated native plant and seed producers operate in Western Canada, most at part-time or small-to-medium scale (NPSS, 2025). The Canadian Wildlife Federation's 2023 survey recorded 48 producers nationwide, with concentrations in Alberta, Saskatchewan, Manitoba, Ontario, and British Columbia (H. Abbandonato, pers. comm., July 31, 2025). Brett Young Seeds lists 28 active producers in its network, including 14 in Alberta, 6 in Saskatchewan, and 8 in Manitoba (A. Demeters, pers. comm., July 14, 2025). Production volumes remain modest: the NPSS 2024 Assessment reported an average of 1,210 pounds of seed per producer annually (134,719 pounds total), while wild harvesters averaged

only 170 pounds (5,430 pounds total). Most producers earn less than $100,000 gross sales annually, underscoring both the niche scale of the sector and its untapped growth potential.

Production trends further highlight vulnerability. Statistics Canada data (2008–2023) show that some species, such as Slender Wheatgrass, have maintained relatively stable outputs with periodic peaks, while others such as Green Needle Grass experienced sharp declines after 2012 and virtually disappeared from commercial production by 2015 (Statistics Canada website; Accessed August 9, 2025). In Saskatchewan, fewer than 10 growers and buyers have contributed to the provincial native forage seed check-off over the past 18 years, generating only $66,000 in total levies, illustrating the very small scale of the native forage seed industry in the province (J. Relf-Eikstein, pers. comm., February 21, 2024).

An earlier generation of Canadian initiatives demonstrates both the potential and the vulnerability of native seed development without sustained policy and market support. Ducks Unlimited Canada's Ecova program, launched in the early 2000s, pioneered the production of genetically diverse, regionally adapted native grass seed using the Canadian Seed Growers' Association (CSGA) Pre-Variety Germplasm standards. Ecovar varieties such as *AC Polar* (northern wheatgrass), *AC Sharptail* (needle-and-thread grass), *AC Pintail* (awned wheatgrass), and *AC Mallard* (green needlegrass) were widely used in restoration and forage applications and demonstrated how conservation-driven seed systems could align with agricultural production (Coleman, 2015). However, following the sale of the program to a private seed company and the absence of long-term procurement commitments, most Ecovar varieties are no longer commercially available. Similarly, the Alberta Research Council (ARC) developed more than 20 native grass and forb varieties in the 1990s including *ARC Plateau* (Rocky Mountain fescue), *ARC Centennial* (Canada wildrye), and *ATTF Badlands* (blue grama), yet none remain in active production today (Marshall Mackenzie, pers. comm., August 11, 2025). These programs collectively illustrate a recurring challenge in Canada: significant public investment in native seed development without the enduring infrastructure, seed increase programs, or market certainty required to maintain availability over time (Woosaree, 2010). Their legacy reinforces the need for a coordinated national strategy that links research, seedbanks, producers, and procurement policy to ensure long-term continuity rather than episodic success.

Despite these challenges, growth potential is significant. Emerging markets include municipal green infrastructure, pollinator habitat initiatives, regenerative agriculture, Indigenous-led restoration, industrial offset projects, biodiversity net gain programs, and climate adaptation efforts. International experience shows that with coordinated policy, targeted investment, regional seedbanks, and clear standards, native seed industries can scale rapidly to meet demand.

By adapting proven approaches from Europe and the United States including national strategies, prairie-specific seed transfer zones, producer networks, and "Buy Canada First" procurement policies, Canada can reduce reliance on imported or non-local seed. When combined with rewilding and ecological principles such as prescribed fire, targeted grazing, regenerative

agriculture, and hydrological renewal, native seed can anchor multifunctional landscapes that deliver biodiversity conservation, climate resilience, and agricultural sustainability.

1.4 Objectives of Study

This Nuffield Canada study aims to:

1. Examine international models where policy, regulation, and investment support robust native seed systems.
2. Identify barriers and enablers to scaling a prairie-adapted native seed industry in Western Canada.
3. Assess the role of seedbanks in conservation, restoration supply, and climate adaptation.
4. Explore emerging markets for native plants beyond traditional restoration.
5. Propose a practical roadmap to support producers through policy reform, infrastructure investment, and coordinated networks.

1.5 Key Questions

To guide this research, the following questions were explored:

1. Which policy and procurement models support successful native seed systems internationally?
2. How are producers recruited, trained, and retained in other jurisdictions?
3. What role do seedbanks play in stabilizing restoration supply chains?
4. How can Canada align native seed systems with biodiversity, climate, and reconciliation goals?
5. Which emerging markets offer the greatest opportunity for growth?
6. How can native seed be positioned as both ecological infrastructure and an economic driver?

1.6 Approach to Study and Travel Summary

This research was conducted through field visits, interviews, conferences, and site-based learning across eight countries in Europe and North America, as well as Brazil, complemented by engagement with Canadian producers, policymakers, and restoration practitioners. The study combined direct observation of functioning native seed systems with discussions involving seed producers, seedbank managers, restoration ecologists, government agencies, NGOs, Indigenous organizations, and researchers. Emphasis was placed on understanding how native seed systems are governed, financed, scaled, and integrated into restoration policy and practice, and how these models could be adapted to Western Canada.

Key international visits included the Millennium Seed Bank at Kew and Emorsgate Seeds (England); Germany's Verband deutscher Wildsamen- und Wildpflanzenproduzenten (VWW) and Rieger-Hofmann GmbH, leaders in provenance-based native seed production and the University of Osnabrück seedbank; the USDA-ARS National Laboratory for Genetic Resources Preservation (Colorado); and innovative farm-based seed enterprises such as Design by Nature

(Ireland), Borderlands Nursery (Arizona), and Nordic Botanicals (Estonia). These visits provided insight into how seedbanks, producer networks, and policy frameworks function together as integrated systems rather than isolated initiatives.

The study also examined rewilding (wilding) approaches, particularly at the Knepp Estate (England) and Nature Farm BEKAS (Latvia), where restoration emphasizes natural processes such as grazing, regeneration, and hydrology. These sites demonstrated how seed-based restoration can complement rewilding by reintroducing keystone species, rebuilding functional plant communities, and supporting biodiversity recovery while creating viable rural economies through agriculture, ecotourism, and stewardship.

Conference participation further broadened the scope of learning, including multiple Society for Ecological Restoration (SER) conferences (Quebec City, Tartu Estonia, Vancouver, Denver), the National Native Seed Conference (Tucson), and the Nature Restoration Forum (Ottawa). These forums provided opportunities to synthesize emerging science, policy developments, and practitioner experience across jurisdictions.

Within Canada, meetings were held across British Columbia, Alberta, Saskatchewan, and Manitoba, including visits with producers, conservation organizations, and government agencies. These engagements highlighted both innovation and persistent gaps in seed production capacity, processing infrastructure, and coordinated procurement. Together, domestic and international observations reinforced a consistent finding: ***successful ecological restoration depends on ensuring the right seed is available, in the right place, at the right time.***

International examples confirm that ***coordinated policy, stable procurement, quality standards, seedbanks, and strong producer networks are essential for scaling restoration***. These insights directly inform Canada's opportunity to transform its fragmented native seed sector into a coordinated, policy-supported, and producer-driven industry capable of meeting biodiversity, climate, and reconciliation objectives.

Full details of site visits, conferences, and interviews are provided in Appendix A.

Figure 6. Blazing Star Wildflower Seed Company's farm and wildflower seed production plots near Aberdeen, SK in June 2025.

2.0 CONTEXT OF THE NATIVE SEED INDUSTRY

2.1 Global Perspectives

2.1.1 Global Restoration Commitments and Native Seed Demand

Global efforts to halt biodiversity loss and restore degraded ecosystems have accelerated rapidly over the past decade, driving unprecedented demand for ecologically appropriate native seed. The United Nations Decade on Ecosystem Restoration (2021–2030), led by the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization (FAO), calls for large-scale restoration as a cornerstone of biodiversity conservation, climate resilience, food security, and human well-being (Nelson et al., 2024).

This momentum was reinforced by the adoption of the Kunming–Montreal Global Biodiversity Framework (GBF) in 2022. Of relevance to native seed systems are Target 2, which commits countries to restoring at least 30% of degraded ecosystems by 2030, and Target 4, which emphasizes halting species loss and maintaining genetic diversity, including through ex situ conservation such as seed banking (Convention on Biological Diversity, 2022). Together, these targets establish a clear global mandate for large-scale, seed-based ecological restoration using genetically appropriate plant material.

Canada has formally committed to these global goals through its participation in the Bonn Challenge and the implementation of its 2030 Nature Strategy, including a national pledge to restore two million hectares of degraded ecosystems by 2030 (Environment and Climate Change Canada, 2023). Achieving these commitments will require reliable access to regionally adapted native seed at unprecedented scales.

Meeting global and national restoration targets ultimately depends on having the right seed, in the right place, at the right time. Without coordinated seed production, provenance guidance, and long-term seedbanking infrastructure, restoration efforts risk being constrained by inadequate supply, inappropriate sourcing, and the erosion of genetic diversity.

Figure 7. The 23 Targets of The Kunming-Montreal Global Biodiversity Framework (source: www.cbd.it/gbf/branding)

2.1.2 Seedbanks and Global Restoration Infrastructure

Seedbanks play a central role in supporting global restoration efforts by safeguarding genetic diversity and supplying plant material for research, restoration, and climate adaptation. Worldwide, more than 1,750 seedbanks operate globally, with over 480 focused on wild native species (White et al., 2023). Leading examples include the Millennium Seed Bank Partnership at the Royal Botanic Gardens, Kew, the USDA–ARS National Laboratory for Genetic Resources Preservation in the United States, and the Australian Seed Bank Partnership.

Figure 8. Kew Millennium Seedbank at Kew Botanical Gardens in Wakehurst, England (left) and Dr. Sabine Zachgo, Director of Botanical Gardens at the University of Osnabruck Seedbank in Osnabruck, Germany (right)

These institutions function not only as long-term conservation repositories but also as active components of restoration supply chains. They support seed collection, viability testing, storage, research, and, increasingly, the provision of foundation seed to commercial producers. By maintaining genetically diverse and well-documented collections, seedbanks reduce pressure on wild populations while enabling restoration at scale.

Botanical gardens further strengthen this global infrastructure. Through the Botanic Gardens Conservation International (BGCI) network, more than 600 institutions worldwide contribute to seed conservation, research, training, and public education, helping translate global biodiversity commitments into practical restoration outcomes (Ren and Antonelli, 2023).

Figure 9. University of Tartu Botanical Garden showcasing Estonia's native flora with over 70-different native species (left) and Denver Botanical Garden's Lisa Porter Plains Garden with a 7-acre demonstration prairie with over 250 local native species (right).

2.1.3 International Networks and Standards for Seed-based Restoration

As restoration demand grows, international networks have emerged to improve coordination, quality, and consistency in native seed use. The International Network for Seed-based Restoration (INSR), established by the Society for Ecological Restoration (SER), connects researchers, practitioners, seed producers, policymakers, and conservation organizations to advance best practices in seed sourcing, production, and deployment (International Network for Seed-based Restoration, www.ser-insr.org).

To address the lack of consistent quality assurance in native seed systems, INSR and partners developed the *Principles and Standards for Native Seeds in Ecological Restoration* (Pedrini and Dixon, 2020), building on the broader SER International Standards for the Practice of Ecological Restoration (Gann et al., 2019). These guidelines provide adaptable frameworks for defining native seed, improving labeling and traceability, and aligning seed use with ecological objectives across diverse regions.

Figure 10. Native Seed Supply Chain and Restoration Activities - The Connection (Source: International Native Seed-based Restoration www.ser-insr.org/native-seed-standards)

Collectively, these global initiatives highlight a consistent lesson: large-scale ecological restoration requires native seed systems that are intentionally designed, policy-supported, and integrated across conservation, agriculture, and restoration sectors. Countries that have aligned seed production, seed banking, and procurement with biodiversity commitments are better positioned to deliver durable ecological outcomes.

2.1.4 Implications for Canada

While global restoration targets have catalyzed significant investment in native seed systems in Europe, the United States, and Australia, Canada has yet to fully translate these commitments into coordinated national action. Despite endorsing the Global Biodiversity Framework, the Bonn Challenge, and the UN Decade on Ecosystem Restoration, Canada lacks a national native seed strategy, comprehensive seed zoning, and integrated seedbank infrastructure tailored to prairie ecosystems.

The global experience demonstrates that restoration ambition alone is insufficient. Without proactive investment in seed supply chains, restoration targets risk outpacing the capacity of domestic producers and conservation institutions. These international lessons provide a critical foundation for examining how Europe and the United States have operationalized seed-based restoration and how Canada can adapt those approaches to build a resilient native seed system for Western Canada.

2.2 The European Perspective

2.2.1 Europe's Policy Driven Restoration Economy

Europe provides one of the clearest global examples of how native seed systems can be scaled through coordinated policy, regulation, and market design. Native seed production across much of Europe is no longer treated as a niche conservation activity, but as essential restoration infrastructure embedded within biodiversity legislation, agricultural policy, and land-use planning.

The adoption of the European Union Nature Restoration Law (2024) represents a watershed moment for ecological restoration. The law commits EU Member States to restoring at least 20% of land and sea areas by 2030, and all ecosystems in need of restoration by 2050 (Grabbe et al., 2025). National Restoration Plans must identify priority habitats, restoration targets, and implementation mechanisms, explicitly recognizing the need for provenance-based native seed supply. This legislation operationalizes global commitments under the Kunming–Montreal Global Biodiversity Framework, translating aspirational targets into legally binding restoration demand.

The result is a predictable, long-term market for native seeds and one that provides producers with confidence to invest in infrastructure, mechanization, and training. This policy-driven approach stands in contrast to Canada's largely project-based and short-term funding environment.

Figure 11. Natie Seed Producers Panel at the 2024 Society for Ecological Restoration - European Chapter Conference on August 27, 2025, in Tartu, Estonia.

2.2.2 Germany: Regiosaatgut and Producer-Led Certification

Germany offers the most mature example of a national native seed system aligned with restoration policy. Under the Federal Nature Conservation Act, most public restoration projects are required to use regionally sourced native seed (*Regiosaatgut*), ensuring ecological integrity while supporting domestic producers (Prasse et al., 2010).

Germany is divided into 22 native seed transfer zones, grouped into larger production regions. Seed must originate from wild collections within the same zone in which it is used, and commercial multiplication is limited to a defined number of generations to prevent genetic drift. Full traceability from wild collection through commercial production is required.

Figure 12. Native Seed Transfer Zones (22 Zones) and Production Zones (11 Zones) in Germany (Source: VWW Website).

The Verband deutscher Wildsamen- und Wildpflanzenproduzenten (VWW) plays a central role in implementing this system. As a producer-led association, VWW develops certification standards, oversees quality assurance, and acts as an intermediary between producers, policymakers, and restoration practitioners (VWW, 2024). This model demonstrates the value of strong producer organizations in shaping legislation, maintaining standards, and securing stable demand.

Figure 13. German VWW Certification Label for Native Seeds (left) and Ernst Rieger with Rieger-Hofmann GmbH in Blaufelden-Raboldshausen, Germany showing freshly cleaned native seed (right).

Germany's experience illustrates how clear rules, enforced standards, and producer coordination can simultaneously improve restoration outcomes and create a viable agricultural sector around native seed.

2.2.3 The United Kingdom: Biodiversity Net Gain and Market Creation

In the United Kingdom, native seed demand is increasingly driven through land-use planning rather than conservation policy alone. The Environment Act (2021) introduced mandatory Biodiversity Net Gain (BNG) requirements, which came into force in 2024. Most new developments in England must now deliver a minimum 10% measurable biodiversity improvement, maintained for at least 30 years (UK Government, 2023).

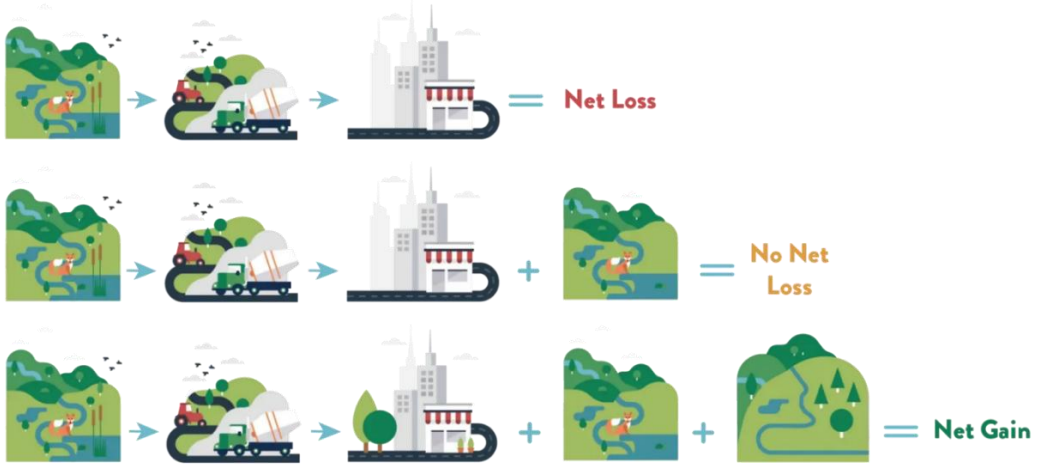

Figure 14. Great Britain's Biodiversity Net Gain Program (Source: Biodiversify www.biodiversify.com/what-is-biodiversity-net-gain)

BNG has created sustained demand for native seed mixes used in grasslands, meadows, wetlands, and urban green spaces. Unlike short-term restoration projects, BNG embeds restoration into development economics, generating long-term contracts and management obligations. This approach demonstrates how regulatory tools can mainstream native seed use beyond conservation lands into urban and peri-urban landscapes.

Figure 15. A Woodmeadow Making Project near Yorkshire Dales National Park in northern England (left) and a "Cricket bat" Plantation of *Salix alba* (White Willow) as part of a Meadowmaking Project at Telfit Farms near Richmond, England (right).

2.2.4 Rewilding and Process-Based Restoration

Alongside regulatory restoration, Europe has emerged as a leader in rewilding, an approach that emphasizes restoring ecological processes such as grazing, hydrology, and natural regeneration rather than recreating static species compositions.

The Knepp Wilding Project in England is a widely cited example, where free-roaming herbivores have replaced conventional farming to restore ecosystem dynamics. Over two decades, biodiversity has increased dramatically, including the return of rare birds and insects (Tree, 2018). While rewilding often relies heavily on natural regeneration, native seed remains critical where seed sources are absent or landscapes are highly fragmented.

Figure 16. Charlie Burrell owner of Knepp Estates and co-founder of the Knepp Wilding project in West Sussex, England (left) and Viesturs Larmanis, owner of the Nature Farm BEKAS in Valka County, Latvia (right).

In Eastern Europe, projects such as Nature Farm BEKAS in Latvia demonstrate how rewilding principles can be integrated with low-intensity agriculture, haymaking, and grazing to maintain species-rich grasslands. These examples show how restoration can support rural livelihoods, ecotourism, and agricultural diversification, reinforcing the economic case for native seed systems.

Figure 17. Tours of Knepp Wildling Project (left) and Nature Farm BEKAS (right).

For Western Canada, these models underscore the importance of integrating seed-based restoration with fire, grazing, and hydrological processes, rather than treating seed deployment as a stand-alone intervention.

2.2.5 Native Seed Producers, Meadow Making and Market Diversity

Europe's native seed industry is characterized by a diverse mix of producer models, ranging from small, family-run enterprises to large, nationally significant commercial suppliers. This diversity has proven critical in meeting restoration demand across multiple scales from local meadow projects to large infrastructure and biodiversity offset programs while maintaining ecological integrity through provenance-based sourcing.

Figure 18. Sandro Carfola (left), owner of Design by Nature in Carlow, Ireland examining a production field of wildflowers. A Winter Steiger plot combine used for harvesting one of Design by Nature's seed production wildflower meadows (right).

In the United Kingdom and Ireland, companies such as Emorsgate Seeds and Naturescape Wildflower Farm (UK), Design by Nature (Ireland), Meadowmania (UK), and Connecting to Nature (Ireland) have played a central role in the revival of species-rich meadow systems. These enterprises supply carefully designed native grass and wildflower mixes tailored to regional conditions and management objectives, supporting meadow making, roadside verges, farm stewardship schemes, and urban green spaces. Meadow restoration in these contexts often combines native seed sowing with low-intensity grazing or hay cutting, demonstrating how native seed production can integrate with agricultural practices while delivering biodiversity benefits.

Figure 19. Emorsgate Seeds' Seed Cleaning Facility near King's Lynn, England.

On the European continent, larger-scale producers such as Rieger-Hofmann GmbH (Germany) illustrate how native seed production can be scaled under supportive policy frameworks. Operating within Germany's legally mandated Regiosaatgut system, Rieger-Hofmann coordinates a network of more than 100 contracted growers, supplying provenance-certified seed for 22 seed transfer zones for restoration, infrastructure projects, agricultural greening, and municipal landscapes. This model shows how policy certainty, certification standards, and long-term demand enable producers to invest confidently in infrastructure, mechanization, and workforce development.

Figure 20. Wildflower Production Plots at Naturescape Farms near Langar, England (left) and Native Seed Post-cleaning with Provenance Tracking Form at Emorsgate Seeds near King's Lynn, England (right).

In the Baltic region, Nordic Botanicals in Estonia provides a particularly relevant model for Canada. Established through collaboration with the University of Tartu, Nordic Botanicals was

created in response to the absence of native seed sources for landscape architecture, urban greening, and restoration projects in Estonia. The company now supplies locally adapted seed for grasslands, wetlands, and pollinator habitats across Estonia and neighbouring Baltic countries, supporting initiatives such as urban pollinator corridors, schoolyard meadows, and municipal green infrastructure. This university-linked, regionally focused model demonstrates how research institutions can catalyze native seed industries where markets are emerging but not yet fully developed.

Figure 21. Nordic Botanicals Production Fields near Tartu, Estonia.

Across Europe, native seed producers increasingly serve markets beyond traditional ecological restoration. These include pollinator infrastructure along transportation corridors, urban landscaping and green roofs, agricultural stewardship programs, and biodiversity net gain requirements tied to development. In Germany, advanced research and breeding initiatives further extend the role of native plants into pharmaceutical and industrial applications, such as the breeding of Russian dandelion (*Taraxacum kok-saghyz*) for natural rubber production. These efforts demonstrate how native plant systems can support high-value economic sectors while remaining grounded in conservation and genetic stewardship.

Figure 22. Russian Dandelion Breeding for Latex Selection for the Tire Industry (left) and Fred Eikmeyer with ESKUSA in Parkstetten, Germany.

Collectively, Europe's experience shows that a resilient native seed sector depends on producer diversity, policy-backed demand, and market breadth. Small-scale growers support local adaptation, innovation, and community engagement, while larger commercial suppliers anchor national supply chains and infrastructure. Meadow making, urban greening, and emerging commercial uses all expand demand, helping stabilize markets and reduce reliance on short-term restoration funding cycles. These lessons are directly applicable to Western Canada, where similar diversity in producer models and markets will be essential to scaling native seed supply in a sustainable and economically viable manner.

Figure 23. Wildflower Garden at St. James Park at the foot of Buckingham Palace in London, England (left) and a "Green Roof" on a Garbage Stand in Hannover, Germany (right).

2.2.6 Key Lessons from Europe for Western Canada

Europe's experience offers several lessons directly applicable to building a resilient native seed system in Western Canada:

1. **Policy creates markets.** Binding restoration legislation and land-use planning requirements are the primary drivers of stable demand for native seed. The EU Nature Restoration Law, Germany's *Regiosaatgut* framework, and the UK's Biodiversity Net Gain policy show that embedding native seed use into law and procurement creates predictable, long-term markets and reduces risk for producers.
2. **Provenance standards build trust and performance.** European systems emphasize seed zones, traceability, and documentation to ensure ecological appropriateness and long-term restoration success. Germany's legally defined seed transfer zones demonstrate that provenance standards are not barriers to growth, but foundations for market confidence and ecological integrity.
3. **Producer organizations are essential infrastructure.** Strong associations such as Germany's VWW and the European Native Seed Producers Association (ENSPA)

coordinate supply, set quality standards, and advocate for supportive policy. Europe's experience shows that well-resourced producer organizations are critical to sector stability and scale.

4. **Restoration can strengthen rural economies.** Native seed production in Europe supports agricultural diversification, local employment, and rural livelihoods. Meadow-making and rewilding initiatives illustrate how restoration, seed production, and low-intensity grazing can reinforce, rather than compete with, rural economies.
5. **Seed must work with ecological process.** Across Europe, seed-based restoration is most effective when integrated with grazing, hydrological restoration, and natural regeneration. This mirrors Western Canadian grassland systems, where fire and grazing remain fundamental to long-term success.

Taken together, Europe demonstrates that native seed systems thrive where policy, producers, and ecological science are aligned. For Western Canada, the key lesson is practical: coordinated legislation, provenance standards, and producer organization are not optional as they are the enabling conditions for scaling restoration outcomes.

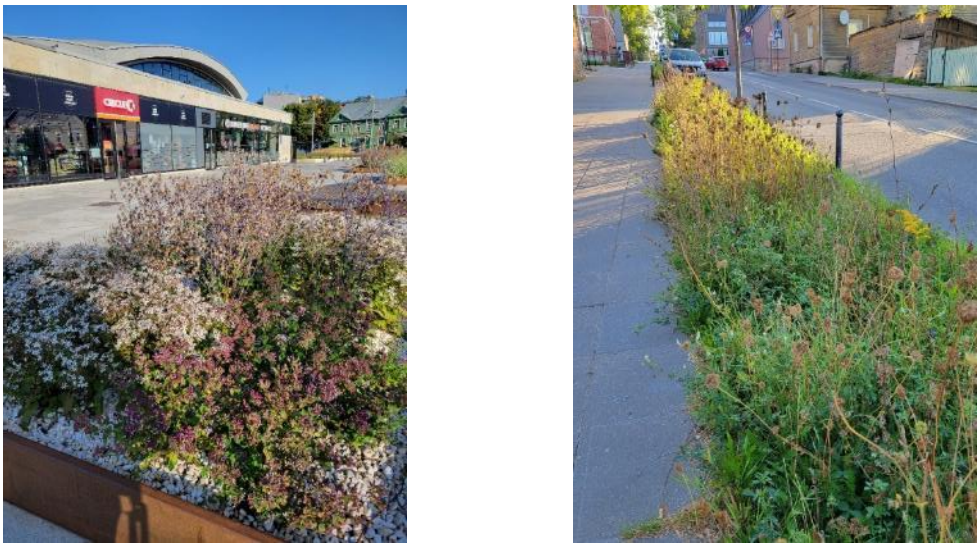

Figure 24. Pollinator Highway "Putukavail" in Tallin, Estonia with a demonstration garden at the Tallin Train Station (left) and a Native Wildflower Pollinator Strips along Sidewalks in Tartu, Estonia (right).

2.3 The United States Perspective

2.3.1 National Native Seed Strategy

The United States has built one of the world's most coordinated native seed systems by linking seed supply directly to national priorities such as wildfire recovery, climate resilience, pollinator conservation, and large-scale rehabilitation. The National Seed Strategy for Rehabilitation and Restoration (commonly referenced as the National Native Seed Strategy) was launched in 2015

and renewed/updated in 2021, led by the Bureau of Land Management (BLM) with a broad partnership network (BLM, 2015; BLM, 2021). The strategy provides a common framework to quantify seed needs, strengthen production capacity, safeguard genetic resources, and build public–private partnerships that can deliver seed at scale.

The strategy is organized around four interrelated goals: identifying seed needs, improving research and technology, developing tools for land managers, and strengthening communication across agencies, tribes, states, producers, and restoration practitioners (BLM, 2015) (Table 1). Together, these goals reposition native seed supply as essential restoration infrastructure planned, coordinated, and funded over the long term rather than treated as an ad hoc procurement challenge.

Table 1. Goals and Objectives of the US National Native Seed Strategy (BLM, 2015)

Goals	Objective Summary
1. Identify and Quantify Seed Needs	1.1 Assess seed needs of federal agencies and producers. 1.2 Evaluate capacity and needs of tribes, states, and private partners. 1.3 Increase supply and ensure reliable access to genetically appropriate seed.
2. Research and Improve Technologies	2.1 Characterize genetic variation to delineate seed zones and transfer guidelines. 2.2 Develop storage, production, and seed technology protocols. 2.3 Research plant establishment, species interactions, and restoration processes. 2.4 Enhance monitoring methods and track long-term restoration outcomes.
3. Develop Tools for Land Managers	3.1 Create training programs for practitioners and stakeholders. 3.2 Build data tools for seed source availability. 3.3 Deliver science-based tools to support restoration planning. 3.4 Use ecological assessments and disturbance data to anticipate seed needs and guide strategies.
4. Strengthen Communication	4.1 Conduct outreach and education through the Plant Conservation Alliance. 4.2 Coordinate internal communication across agencies and establish feedback mechanisms. 4.3 Report progress, recognize achievements, and update the strategy as needed.

Critically, implementation of the National Native Seed Strategy was grounded in a deliberate evidence-to-action sequence. Strategy development was followed by the *National Native Seed Strategy Business Plan 2015–2020* (Olwell and Bosak, 2015) and subsequent *Assessment of Native Seed Needs and the Capacity for Their Supply* (National Academies of Sciences, Engineering, and Medicine. 2023). Together, these reports provided both the scientific rigor and

the economic rationale required to justify sustained federal investment in the native seed industry (P. Olwell, pers. comm., October 3, 2025).

2.3.2 Provisional Native Seed Transfer Zones

A key enabling tool in the U.S. system is the use of seed transfer zones to guide the movement of native seed in ways that protect local adaptation and reduce establishment risk. The provisional seed transfer zones developed by Bower et al. (2014) provide a practical, science-based approach based on climate and ecological variables, offering consistent guidance until finer, species-specific zones can be developed. These zones help reduce risks associated with moving seed too far from its origin, including maladaptation and loss of locally adapted genetic traits (Bower et al., 2014). For the Canadian Prairies, this approach is especially relevant because it provides a transparent method to link provenance, climate, and restoration outcomes at landscape scales.

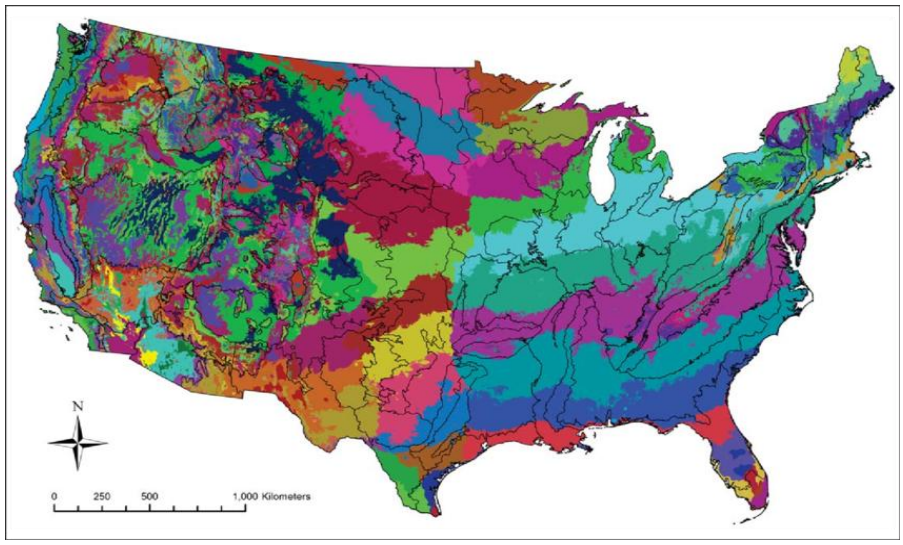

Figure 25. Provisional Seed Transfer Zones in the United States (Bowler et al., 2014).

2.3.3 Building the Supply Chain: From Wild Collection to Commercial Seed

The U.S. approach demonstrates that reliable supply depends on connecting four functions into one system: wild collection → secure conservation storage → applied research → commercial-scale production. Several federal programs collectively support this pipeline.

Figure 26. Native Plant Material Development Process (Source: Native Seed and Plant Development Program www.blm.gov/programs/natural-resource/native-plant-communities/native-seed-and-plant-material-development)

The Seeds of Success (SOS) program, established in 2001 and led by BLM with partners, builds the foundational genetic "library" by collecting wild seed using standardized protocols, with material conserved for restoration, research, and development pathways (BLM, 2001; BLM SOS program materials). SOS collections are then supported through programs designed to develop and scale plant materials into usable quantities for restoration.

Figure 27. The USDA National Laboratory for Genetic Resources Preservation in Fort Collins, Colorado.

Complementing SOS, the Native Plant Materials Development Program strengthens the link between genetic conservation and real-world application through research, grow-out, and commercialization pathways that support regionally appropriate supply (BLM, Native Plant Materials Development Program materials). At the national scale, long-term conservation and documentation capacity is reinforced by the USDA National Plant Germplasm System (NPGS), a networked genebank system that safeguards extensive plant genetic resources and supports distribution for research and use (USDA-ARS GRIN; Vol et al., 2023).

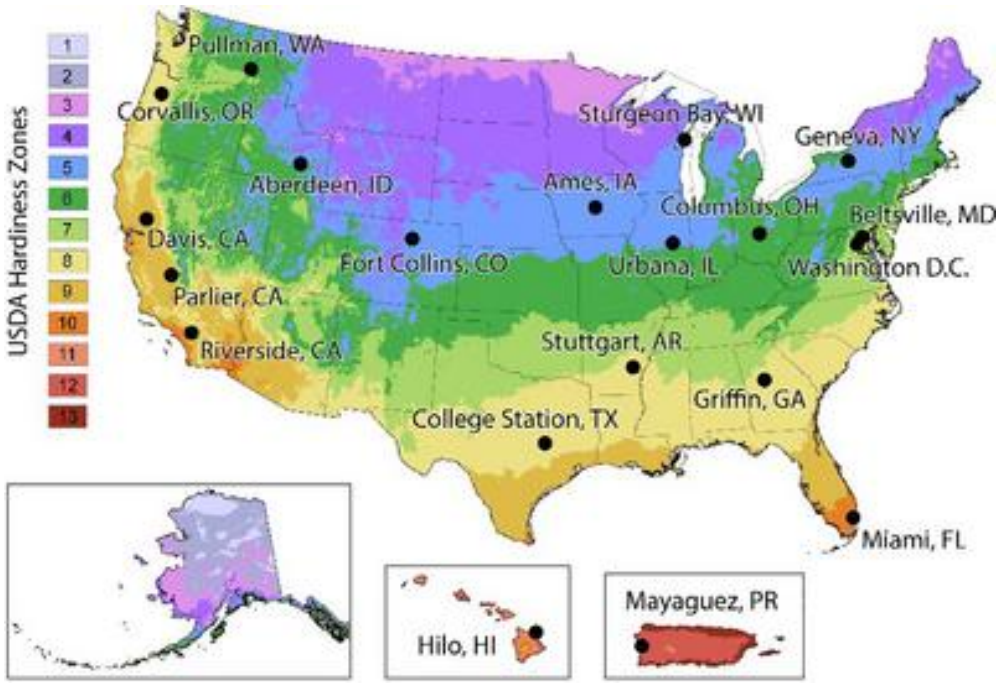

Figure 28. US National Plant Germplasm System (NPGS) Genebank Locations (Vol et al., 2023)

Together, these programs illustrate a central lesson: seed supply becomes reliable when conservation, science, and production are treated as an integrated system rather than separate, underfunded activities.

2.3.4 Regional Partnerships and the Role of Networks

While national frameworks provide direction, the U.S. system is operationalized through regional seed partnerships that align local ecological priorities with practical production and delivery. Networks such as the Northeast Seed Network (NESN) and partnerships coordinated through organizations like the Institute for Applied Ecology (IAE) demonstrate “hub-and-spoke” approaches where shared protocols, training, priority species lists, and infrastructure help small and mid-scale producers supply real restoration demand.


Figure 29. Francesca Claverie with Borderlands Nursery, showing the Portable Seedbank and Nursery Plots in Patagonia, Arizona.

Research emerging from these efforts reinforces that restoration seed systems function as complex social networks, not linear markets. In analyzing seed supply chains associated with NESN, Allen et al. (2024) emphasize that trust, communication, coordination, and long-term institutional support are as critical as technical aspects such as agronomy and genetics. This finding maps closely onto Western Canada's current challenges: fragmented demand, uneven infrastructure, and limited mechanisms to connect growers, practitioners, agencies, and Indigenous partners in durable ways.

The U.S. also demonstrates how strategies can be tailored to ecosystem scale and geography. For prairie and grassland contexts relevant to Western Canada, the Northern Great Plains Native Seed Strategy highlights the value of transboundary coordination, shared seed zone development, foundation seed pathways, and producer capacity-building in a region that spans both countries (Perkins et al., 2024).

2.3.5 Key Lessons from the United States for Western Canada

The U.S. experience offers several lessons directly applicable to building a resilient native seed system in Western Canada:

1. **A national strategy creates coherence and funding durability.** The National Seed Strategy provides shared goals, quantifies needs, and ties native seed to major national priorities.
2. **Seed zones translate science into procurement confidence.** Provisional transfer zones provide practical guidance for large-scale use and reduce ecological.
3. **Supply chains succeed when collection, banking, research, and production are linked.** SOS, NPMDP, and NPGS demonstrate an integrated pipeline that enables both conservation and scalable supply.

4. **Regional partnerships are essential delivery mechanisms.** Networks translate national intent into operational supply, training, and shared infrastructure at local scales.
5. **Seed systems are social systems.** Long-term success depends on trust, coordination, and stable governance, not just seed yield and equipment.
6. **Grassland-focused strategies matter.** Northern Great Plains coordination provides a relevant model for Western Canada, including cross-border alignment around shared ecosystems.

Taken together, the U.S. model demonstrates how federal leadership, applied science, and regional collaboration can build a seed sector capable of meeting restoration demand at scale. For Western Canada, the central takeaway is practical: ***if Canada wants the "right seed, in the right place, at the right time," it must invest not only in seed production, but also in the connected infrastructure, policy mechanisms, and networks that make supply reliable.***

2.4 The Current Canadian Situation

2.4.1 National and International Commitments

Canada has committed to ambitious restoration and biodiversity targets under the Kunming–Montreal Global Biodiversity Framework (GBF), the Bonn Challenge, and Canada's 2030 Nature Strategy (Environment and Climate Change Canada, 2024). These include restoring at least 30% of degraded ecosystems globally by 2030 and achieving national restoration targets of approximately 2 million hectares of degraded terrestrial and aquatic ecosystems. For Western Canada, this translates into a substantial expansion of grassland and wetland restoration at scales not previously attempted.

Meeting these commitments will require a reliable supply of regionally adapted native seed. However, as demonstrated throughout this report, Canada's native seed sector, particularly in Western Canada, remains fragmented, underdeveloped, and unsupported by a cohesive national framework.

Figure 30. Resource Conservation Technicians cleaning seeds at Grasslands National Park's Native Seed Cleaning and Storage Facility in Eastend, SK.

2.4.2 Industry Status and Persistent Challenges

Unlike Europe and the United States, Canada has no National Native Seed Strategy, no standardized seed transfer zones for prairie species, and limited procurement policies to stabilize demand. These gaps were first clearly identified in the 2010 *Market Assessment of the Native Plant Industry in Western Canada* (Woosaree, 2010) and remain largely unresolved today. Recent regional assessments reinforce the same conclusions. Surveys conducted in Southern Alberta (Powter & Smreciu, 2025), Saskatchewan (Native Plant Society of Saskatchewan, 2024), and Manitoba (Murray et al., 2025) consistently identify insufficient production capacity, inconsistent demand, limited access to foundation seed, and inadequate infrastructure for cleaning, storage, and distribution. While modest improvements in species diversity and producer numbers have occurred, most operations remain small-scale or part-time, limiting the sector's ability to respond to large-scale restoration demand.

Current estimates suggest fewer than 50 dedicated native seed producers operate in Western Canada, with production volumes and revenues highly variable (NPSS, 2024). This volatility exposes restoration projects to supply shortages and increases reliance on imported or ecologically inappropriate seed.

Figure 31. ALCLA Native Plants on-farm sales location near Carstairs, AB (left) and Latifa Pelletier-Ahmed and Ben Haitch, owners of ALCLA Native Plants (right).

2.4.3 Seed Policy, Regulation, and Provenance

Under Canada's Seeds Act and Seeds Regulations, seed sold commercially must meet basic quality and labeling standards. However, most native species are marketed as common seed, with only three native grass species currently registered under the pedigreed seed system. As a result, most prairie native seed lacks formal certification, traceability, or provenance standards.

By contrast, Canada's forestry sector has long applied seed transfer guidelines to ensure local adaptation and genetic integrity. Alberta alone uses 90 forest seed zones (Alberta Agriculture and Forestry, 2016). Extending similar science-based seed transfer zones to prairie and grassland species would significantly improve restoration outcomes, provide confidence to buyers, and support the development of certification and procurement standards.

The CFIA Forward Regulatory Plan (2025–2027) represents a critical inflection point for Canada's native seed sector. Regulatory modernization creates an opportunity to formally recognize restoration-focused native seed systems, but without targeted engagement, these systems risk being unintentionally constrained by commodity seed frameworks.

2.4.4 Market Dynamics, Non-profits, and Capacity

Non-profit organizations play an important role in conservation and public engagement but can unintentionally destabilize commercial markets when seed is produced or distributed below cost. A more strategic role for non-profits is to act as facilitators which can aggregate demand, support seed increase programs, provide shared infrastructure, and partner with producers rather than competing with them.

Programs such as WWF-Canada's Native Seed Orchard initiative demonstrate how non-profits can invest in production capacity while reducing pressure on wild populations. Community-based initiatives, including pollinator garden programs, further expand public awareness and grassroots demand, complementing large-scale restoration efforts.

At the same time, education, forward contracting, and long-term partnerships between producers and users are critical to stabilizing markets and aligning production timelines with restoration needs.

2.4.5 Seedbanks and Long-Term Conservation

Canada's seedbanking capacity is uneven but growing. National institutions such as Plant Gene Resources of Canada (PGRC) and the National Tree Seed Centre (NTSC) provide long-term genetic conservation for crops, trees, and shrubs. However, there remains a significant gap in seedbanking infrastructure for grassland and prairie species.

Figure 32. Agriculture and Agrifood Canada's Plant Gene Resources of Canada in Saskatoon, SK with Curator Dr. Axel Diederichson (left) and the center's Seedbank (right).

The proposed Meewasin Native Prairie Seedbank in Saskatoon, SK addresses this gap by focusing on prairie and parkland ecosystems, supplying foundation seed, reducing reliance on wild harvest, and supporting commercial production. Complementary initiatives, including Indigenous-led seed collection programs at NTSC and proposed regional seedbanks in British Columbia, demonstrate how ecological and cultural objectives can be integrated through seed conservation.

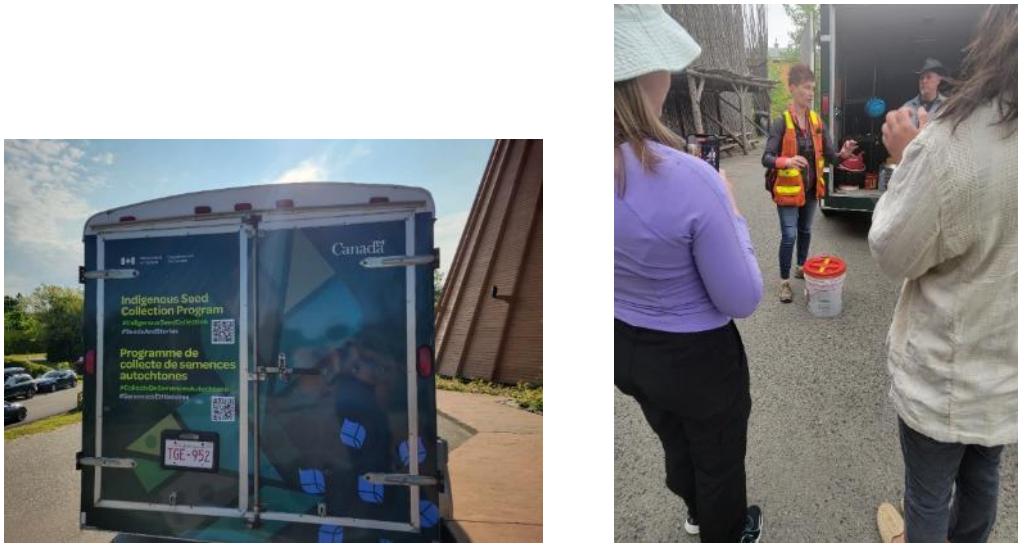

Figure 33. Natural Resources Canada's National Tree Seed Center's Indigenous Seed Collection Program Trailer (left) and the late Melissa Spearing and Donnie McPhee (right) hosting an Indigenous Seed Collecting Workshop in Quebec City, Quebec in June 2023.

Connecting these efforts into a coordinated national network would significantly strengthen Canada’s capacity to safeguard genetic diversity while supplying restoration and production needs.


Figure 34. Eastern Slopes Rangeland Seeds / Tannas Conservation Services from Cremona, AB with their Foothills Fescue plug production greenhouse (right) and new Passive Solar Greenhouse for production of native plants (right).

2.4.6 Emerging Networks and Strategic Momentum

Despite longstanding structural gaps, momentum is now building across Canada through the emergence of producer-led networks and regional collaboratives focused on strengthening the native seed sector. These initiatives represent a critical shift from isolated, informal operations toward coordinated, collective action.

The Native Seed Producers of Canada (NSPC) has emerged as a national, producer-driven organization providing a unified voice for native seed growers across the country. NSPC is working to advocate for procurement reform, access to foundation seed, provenance standards, native seed labeling, and infrastructure investment, while also creating opportunities for peer-to-peer learning, mentorship, and collaboration. Importantly, NSPC grounds national discussions in the practical realities of production, ensuring that emerging policies and strategies are informed by on-the-ground experience.

Figure 35. Michael and John Skinner with Skinner Native Seeds near Roblin, MB installing wildflower plugs into seed production plots (Skinner Native Seeds photo) (left) and Kelly Leask, owner of Prairie Originals near Selkirk, MB (right).

At the regional level, the Southern Alberta Native Seed Collaborative has demonstrated how localized coordination can align producers, land managers, NGOs, and researchers around shared priorities. Building on this model, the Southern Alberta group is now working closely with the Manitoba–Saskatchewan Native Seed Collaborative, with the intent of merging efforts to create a stronger, prairie-wide voice. This growing Prairie collaboration reflects recognition that seed zones, markets, and restoration demand often transcend provincial boundaries, and that coordinated regional advocacy is essential for influencing policy, procurement, and investment at scale.

Figure 36. Nathan Gill, owner of EcoLogic Horticulture, showing their NatureTurf product used as native grass turf at their farm near Strathmore, AB (left) and EcoLogic's "Seedbank" for a project with the City of Calgary for Haskayne Park (right).

In Southern Ontario, momentum is also accelerating. Under the umbrella of the Southern Ontario Native Seed Strategy, at least five regional producer and practitioner groups are forming to address localized supply gaps, coordinate production, and engage municipalities and conservation authorities. These groups illustrate how a shared strategic framework can catalyze regionally tailored action while contributing to broader provincial and national objectives.

Collectively, these emerging networks mirror early stages of producer organization seen previously in Europe and the United States, where informal collaborations eventually evolved into formal associations with stable funding, governance structures, and policy influence. While most Canadian networks remain hopeful and under-resourced, their rapid development signals both readiness and demand for a coordinated national approach. Sustained investment, formal governance, and integration with a National Native Seed Strategy will be essential to ensure that this momentum translates into lasting capacity, market stability, and a resilient native seed industry across Canada.

2.4.7 Lessons from Forestry and Strategic Outlook

Canada's forestry seed systems demonstrate the value of long-term investment in seed zones, seed orchards, certification, and storage infrastructure. At the same time, forestry also illustrates the risks of under-investment in skilled collectors, processing capacity, and demand forecasting; challenges that closely mirror those faced by prairie native seed producers.

The native seed sector in Western Canada is therefore at a turning point. Strong producer expertise, emerging networks, and growing policy attention provide a foundation for growth. However, without coordinated action, particularly in procurement, seed transfer standards, seedbank development, and producer support the sector will remain unable to meet national restoration commitments.

Figure 37. Pollinator Paradise YXE Native Plant Garden Tour in Saskatoon, SK in July 2025.

2.4.8 Toward a National Native Seed Strategy

The Canadian Wildlife Federation's ongoing development of a National Native Seed Strategy represents a critical opportunity to align regional initiatives with federal biodiversity and climate goals. For this strategy to succeed, native seed producers must remain central to its design and implementation, ensuring that standards, seed zones, foundation seed programs, and procurement policies are practical and scalable.

With coordinated leadership, Canada can transition from a fragmented system to a resilient, producer-driven native seed industry capable of supporting biodiversity recovery, climate adaptation, and rural economic development across Western Canada.

Figure 38. Plains Rough Fescue, a provincially rare grass in Saskatchewan that was once dominant across the northern grainbelt of Western Canada in seed production plots (right) and Lisa Grilz harvesting Three-flowered Aven seeds (right).

2.5 Synthesis and Implications for Canada

Taken together, the comparative analysis underscores that Canada's challenge is not a lack of ecological knowledge, capable producers, or restoration ambition, but the absence of coordinated systems that align policy, markets, and infrastructure. The United States and Europe demonstrate that native seed industries mature when seed supply is treated as critical public infrastructure supported by legislation, long-term procurement, provenance standards, and strong producer organizations. In both jurisdictions, seedbanks, research institutions, and growers operate within clearly defined frameworks that reduce risk, stabilize demand, and enable investment.

For Western Canada, these examples offer a clear and achievable pathway forward. While Canada's governance structure, land tenure, and ecological contexts differ, the underlying principles are transferable: ***policy must create demand, science must guide provenance, seedbanks must anchor supply chains, and producers must be supported as essential partners***

in restoration. Importantly, Canada can adapt these lessons without replicating foreign systems wholesale, building instead on existing strengths such as forestry seed transfer models, emerging producer networks, and growing Indigenous-led stewardship initiatives.

This comparative perspective reinforces the central argument of this report: ***that scaling ecological restoration in Western Canada requires moving beyond project-by-project approaches toward an integrated, policy-supported native seed system***. The following section translates these international and domestic lessons into a cohesive framework and set of actions tailored specifically to Western Canada's ecological, agricultural, and governance realities.

Table 2. Comparative Perspectives on Native Seed Systems: Canada, United States, and Europe

Aspect	Canada	United States	Europe
National Strategy	No formal national native seed strategy (in development through CWF with producer and Indigenous engagement). Fragmented regional efforts.	National Native Seed Strategy provides a federal framework linking seed supply to wildfire recovery, restoration, and climate resilience.	EU Nature Restoration Law (2024) creates binding restoration targets; national strategies implemented by Member States (e.g., Germany, UK).
Seed Transfer Zones	Applied in forestry (tree seed only); no established seed transfer zones for prairie or grassland species.	Provisional seed transfer zones across the continental U.S. guide genetic appropriateness for restoration.	Germany mandates Regiosaatgut seed zones by ecoregion; broader continental coordination supported through ENSPA.
Seed Certification & Standards	Most native species sold as common seed; very limited pedigreed or provenance-based certification; inconsistent quality assurance.	Quality standards supported through BLM/USDA programs; seed sourcing linked to procurement and restoration guidance.	Provenance-based certification mandatory in Germany; quality control coordinated through producer associations (e.g., VWW, ENSPA).
Seedbanks & Genetic Conservation	National capacity focused on crops and trees (PGRC, NTSC); limited grassland coverage. Regional initiatives emerging (e.g., Meewasin Seedbank).	Integrated system: Seeds of Success, National Plant Germplasm System, and NLGRP safeguard wild genetics and support scaling into production.	Extensive network of national and regional seedbanks (e.g., Millennium Seed Bank, national banks) linked to restoration and research.
Producer Networks	Emerging national and regional networks (NSPC, Southern Alberta, Manitoba–Saskatchewan);	Strong regional partnerships (NESN, Willamette Valley, Southwest Seed Partnership) alongside	Highly organized producer associations (ENSPA, VWW) coordinating standards,

Aspect	Canada	United States	Europe
	small, fragmented, under-resourced industry.	large commercial producers and NGOs.	advocacy, and supply across countries.
Procurement & Market Stability	Limited procurement policy; reliance on short-term, project-based contracts; high market uncertainty for producers.	Federal procurement (BLM, USFS, wildfire recovery) creates predictable, long-term demand for native seed.	Restoration embedded in law; procurement and planning requirements create stable and expanding markets.
Role of Policy & Legislation	Strong international commitments (GBF, Bonn Challenge, 2030 Nature Strategy) but few binding seed-specific policies.	Native seed integrated into federal agency mandates, restoration planning, and land management policy.	Binding EU and national legislation directly links restoration targets to seed supply requirements.
Industry Scale & Capacity	Fewer than ~50 dedicated producers in Western Canada; mostly small-scale or part-time; limited infrastructure and mechanization.	Large, diverse industry with commercial, non-profit, and Indigenous producers; significant infrastructure and research support.	Well-developed in Western Europe (Germany, UK); growing capacity and market development in Eastern and Baltic states.
Integration with Ecological Processes	Seed use often disconnected from grazing, fire, and landscape-scale planning.	Strong integration with disturbance response (wildfire), climate adaptation, and ecological restoration processes.	Seed-based restoration routinely integrated with grazing, rewilding, meadow making, and landscape planning.
Role of Indigenous & Community Leadership	Growing but inconsistent involvement; Indigenous seed initiatives emerging (e.g., NTSC ISCP).	Tribal participation integrated into federal programs (e.g., SOS collections, restoration partnerships).	Increasing emphasis on community stewardship, cultural landscapes, and traditional land-use systems.

3.0 FROM INSIGHT TO ACTION: Theory of Change and Roadmap for Building a Resilient Native Seed Industry in Western Canada

This section translates the findings of this Nuffield Canada research into a clear Theory of Change and implementation roadmap for strengthening the native seed industry in Western Canada. Drawing on international experience, Canadian market assessments, seedbank initiatives, and restoration policy frameworks, it sets out how targeted investments, coordinated policy, and producer-led action can transform Canada's fragmented seed sector into functioning restoration infrastructure.

Problem Statement

Canada's prairie restoration ambitions now exceed its native seed supply capacity. Fragmented markets, limited infrastructure, insufficient policy alignment, and weak coordination prevent producers from meeting biodiversity, climate, and reconciliation objectives at scale.

Theory of Change (Overview)

If native seed producers are supported through shared infrastructure, seedbanks, policy-aligned procurement, and national coordination, then Canada can reliably supply ecologically appropriate, provenance-based native seed at scale enabling successful restoration, climate adaptation, reconciliation, and rural economic resilience.

International evidence from Europe and the United States consistently demonstrates this logic: where producers are centered, seedbanks are integrated, and policy creates stable demand, native seed systems can scale. Where these elements are absent, restoration outcomes stall.

This Theory of Change is operationalized through five interdependent pillars, each corresponding to key inputs and activities required to generate lasting ecological and economic outcomes.

Pillar 1: Producer-Centered Native Seed Production

(Inputs → Activities → Capacity Outputs)

International experience demonstrates that robust native seed systems depend on sustained investment in producers. Programs such as Germany's Regiosaatgut system and the U.S. National Native Seed Strategy combine regulation, infrastructure, training, and long-term procurement to ensure consistent supply of locally adapted seed.

In contrast, Canada's native seed sector remains fragmented and undercapitalized. Market assessments spanning 2010–2025 repeatedly identify the same constraints: inconsistent demand, limited access to foundation seed, high production costs, inadequate processing infrastructure, and weak training and succession pathways.

Key Insight

Without coordinated investment and stable procurement, Canada's native seed producers cannot scale to meet biodiversity, restoration, and climate adaptation targets.

Priority Actions

- Establish regional producer hubs with shared seed cleaning, testing, storage, and equipment.
- Develop a Canadian foundation seed program using provenance-tracked starter material.
- Implement 5–10 year procurement contracts to stabilize demand.
- Deliver national training programs with agricultural colleges, Indigenous communities, and NGOs.

Outcomes

- *Short term:* Pilot producer hubs and foundation seed collections for priority species.
- *Medium term:* Increased number of active producers and expanded production capacity.
- *Long term:* Domestic producers supply the majority of seed used in publicly funded prairie restoration.

Pillar 2: Seedbanks as Conservation and Supply Infrastructure

(Inputs → Activities → Supply Chain Stability)

Seedbanks are essential to both long-term genetic conservation and restoration supply chains. International models such as the Millennium Seed Bank and the USDA's National Laboratory for Genetic Resources Preservation demonstrate how seedbanks safeguard diversity while actively supporting restoration, climate adaptation, and commercial seed increase.

Canada lacks a dedicated prairie-focused seedbank, leaving many grassland species underrepresented and restoration efforts vulnerable to supply gaps.

Key Insight

A coordinated prairie seedbank system would secure genetic resources while anchoring a reliable national seed supply chain.

Priority Actions

- Establish the Meewasin Seedbank as a prairie-focused pilot facility.
- Align collection and storage protocols with Global Biodiversity Framework targets.
- Integrate Indigenous-led collections for culturally significant species.
- Link seedbank collections directly to foundation seed production.

Outcomes

- *Short term:* Facilities secured and priority species collections initiated.
- *Medium term:* Seedbank outputs integrated into restoration and production systems.
- *Long term:* A National Native Seedbank Network serving Canada.

Pillar 3: Policy, Governance, and Procurement

(Enabling Conditions → Market Creation)

International evidence shows that legislation and procurement standards are the strongest drivers of native seed market development. Germany mandates provenance-based seed use, the EU's Nature Restoration Law links seed supply to legal targets, and the U.S. embeds native seed into wildfire recovery and land management.

Canada lacks comparable frameworks, resulting in fragmented demand and continued reliance on imported or ecologically inappropriate seed.

Key Insight
Without coordinated federal–provincial policy, restoration ambition will continue to outpace seed supply.

Priority Actions
- Develop a Canadian National Native Seed Strategy with binding procurement targets.
- Establish prairie-wide seed zones and certification standards.
- Require Canadian-grown native seed in publicly funded projects.
- Introduce tax incentives or stewardship credits for private landholders.

Outcomes
- *Short term:* National task force established to design policy frameworks.
- *Medium term:* Provincial and Federal implementation and increased domestic seed use.
- *Long term:* Native seed embedded across biodiversity and climate programs.

Pillar 4: Market Diversification and Innovation
(Demand Expansion → Economic Resilience)
Native plants support far more than restoration alone. International examples demonstrate strong demand in pollinator habitat, regenerative agriculture, urban greening, Indigenous food and medicine, and green infrastructure.

Canada has significant untapped opportunity to diversify markets, reduce reliance on short-term restoration projects, and normalize native plants across working and urban landscapes.

Key Insight
Market diversification strengthens producer resilience while embedding native plants into everyday land use.

Priority Actions
- Partner with municipalities on native landscaping standards.
- Expand agricultural pollinator habitat programs.
- Support Indigenous-led food, medicine, and cultural plant enterprises.
- Develop branding and certification for native plant horticultural products.

Outcomes
- *Short term:* Demonstration projects and marketing tools.
- *Medium term:* Expanded municipal and retail demand.
- *Long term:* Sustained growth across agriculture, urban, and cultural markets.

Pillar 5: Collaboration and National Coordination

(Social Infrastructure → System Integration)

Strong producer networks underpin successful native seed systems. Associations such as ENSPA and Seeds of Success demonstrate the importance of coordination, shared standards, and knowledge exchange. In Canada, promising initiatives exist but lack sustained funding and formal governance.

Key Insight

Native seed systems function as social networks as much as supply chains; coordination and trust are as critical as infrastructure.

Priority Actions

- Formally establish the Native Seed Producers of Canada as a national coordinating body.
- Create a national producer registry and capacity database.
- Host annual conferences and technical exchanges.
- Secure stable funding for coordination and strategy implementation.

Outcomes

- *Short term:* Formalized national producer organization.
- *Medium term:* Active regional working groups aligned under a national strategy.
- *Long term:* An integrated national system linking producers, seedbanks, certification, and demand forecasting.

Synthesis and Path Forward

This Theory of Change confirms that Canada's native seed sector is not yet positioned to meet commitments under the Global Biodiversity Framework, the Bonn Challenge, or Canada's 2030 Nature Strategy. However, international experience demonstrates that success is achievable when seed supply is treated as essential restoration infrastructure.

The path forward is not simply to grow more seed, but to build a coordinated, producer-led, policy-supported system. With decisive leadership and targeted investment, Western Canada can transform its native seed industry into a cornerstone of biodiversity recovery, reconciliation, climate resilience, and rural economic development by 2030.

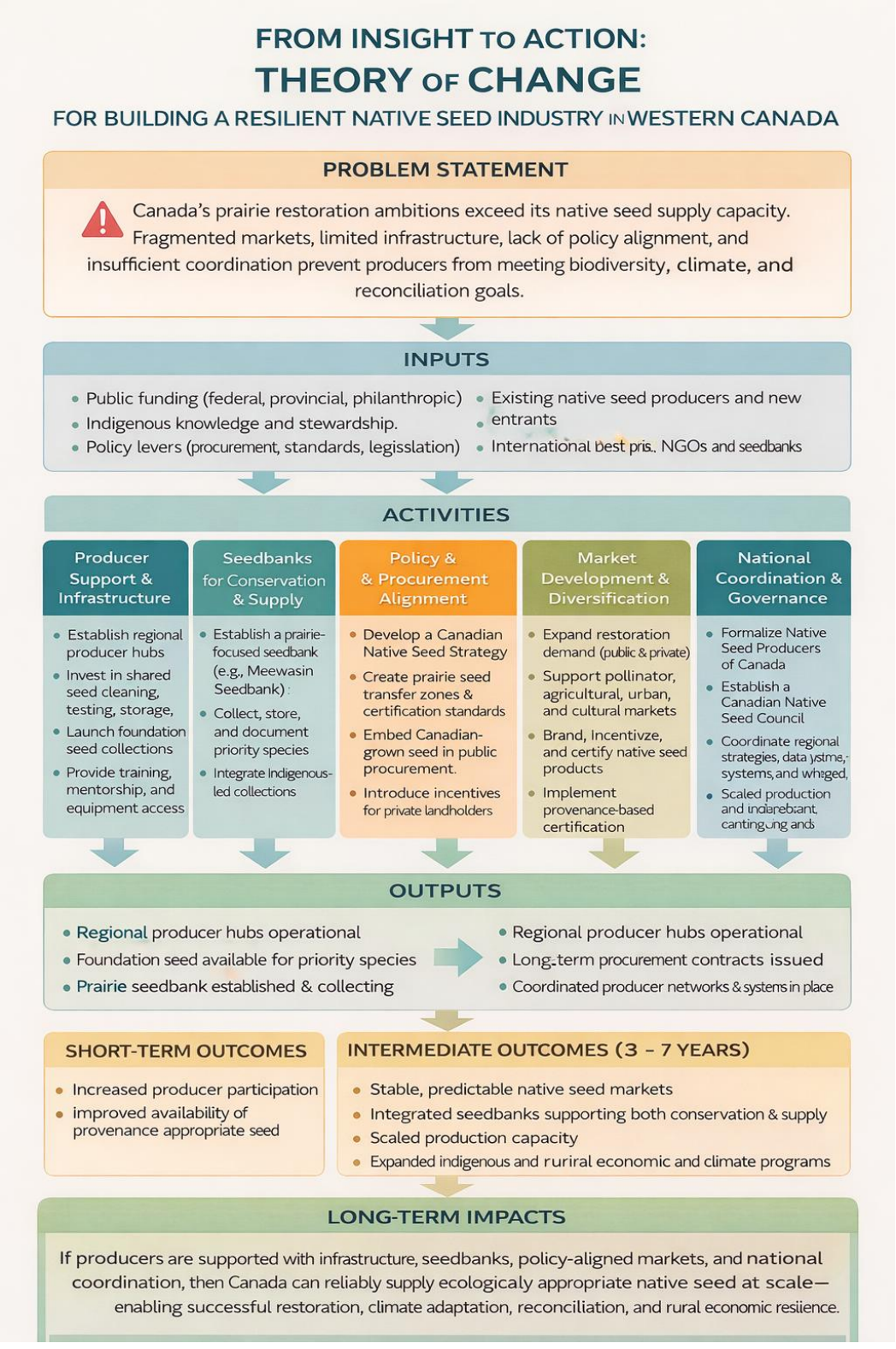

Figure 39. Theory of Change for Building a Native Seed Industry in Western Canada.

Table 3. From Insight to Action: Theory of Change and Roadmap for Building a Resilient Native Seed Industry in Western Canada

Strategic Focus Area	Core Policy Insight	Priority Actions	Expected Outcomes
Producer Support & Infrastructure	Native seed producers are the foundation of the system, but Canada's supply remains fragmented due to limited infrastructure, foundation seed shortages, and unstable demand.	• Establish regional producer hubs with shared seed cleaning, testing, and storage infrastructure • Launch a Canadian Foundation Seed Program with provenance-tracked starter material • Introduce 5–10 year public procurement contracts for priority species • Deliver coordinated training and mentorship programs with agricultural colleges and Indigenous partners	**Short-term:** Pilot producer hubs operational; foundation seed available for priority species **Medium-term:** Expanded number and scale of commercial producers **Long-term:** Majority of seed for public restoration sourced from Canadian prairie producers
Seedbanks for Conservation & Supply	Canada lacks a prairie-focused seedbank, leaving genetic diversity underrepresented and restoration projects vulnerable to supply gaps.	• Establish the Meewasin Seedbank as a prairie pilot seedbank • Align seedbank protocols with Global Biodiversity Framework targets • Integrate Indigenous-led collections for culturally significant species • Link seedbanks directly to foundation seed and commercial production	**Short-term:** Prairie seedbank facility secured; priority collections initiated **Medium-term:** Seedbank material actively supporting restoration and production **Long-term:** A coordinated National Native Seedbank Network safeguarding prairie biodiversity
Policy, Governance & Procurement	Policy and procurement frameworks drive market stability; without them, Canada remains reliant on imports and inconsistent sourcing.	• Develop a National Native Seed Strategy with clear procurement targets • Establish prairie seed zones and provenance-based certification standards • Require Canadian-grown native seed in publicly funded restoration and infrastructure projects • Introduce tax incentives or stewardship credits for private landholders	**Short-term:** National task force and draft procurement standards established **Medium-term:** Provincial policies increase use of Canadian-grown seed **Long-term:** Native seed embedded across biodiversity, climate, and infrastructure programs
Emerging Markets & New Uses	Diversifying beyond restoration increases resilience and embeds native plants into everyday	• Partner with municipalities to create native landscaping and urban greening standards • Expand pollinator habitat and regenerative agriculture programs	**Short-term:** Municipal demonstration projects and producer marketing tools launched **Medium-term:** Expanded retail and

Strategic Focus Area	Core Policy Insight	Priority Actions	Expected Outcomes
	landscapes and economies.	• Support Indigenous-led food, medicine, and cultural plant enterprises • Develop branding and certification for native plants and seed products	municipal demand for native plants **Long-term:** Sustained growth in demand beyond traditional restoration markets
Collaboration & National Coordination	National coordination and producer networks are essential to scale supply and align demand with ecological priorities.	• Formalize the Native Seed Producers of Canada as a national coordinating body • Establish a Canadian Native Seed Council linking producers, Indigenous Nations, governments, NGOs, and researchers • Develop a producer registry and national capacity database • Host annual conferences, exchanges, and training events	**Short-term:** NSPC formalized; national coordination convened **Medium-term:** Active regional working groups implementing the national strategy **Long-term:** Fully integrated national system linking producers, seedbanks, certification, and demand forecasting

4.0 CONCLUSIONS

The future of ecological restoration in Western Canada depends on the deliberate development of a resilient, coordinated, and producer-centered native seed system. Native seed producers which include farmers, small businesses, Indigenous enterprises, and conservation organizations, are not a peripheral component of restoration; they are its foundation. They supply the ecologically appropriate, provenance-based seed required to restore degraded landscapes, recover species at risk, support pollinators, strengthen working lands, and build climate resilience. Without a scalable and reliable native seed supply chain, Canada's commitments under the Kunming–Montreal Global Biodiversity Framework (GBF), the Bonn Challenge, and the 2030 Nature Strategy cannot be achieved.

This Nuffield Canada study demonstrates that successful native seed systems share a common structure, regardless of geography: clear policy direction, stable demand through procurement, coordinated producer networks, and seedbanks functioning as both conservation infrastructure and active partners in production. International examples from Germany's legally mandated Regiosaatgut system, to the U.S. National Native Seed Strategy, to the UK's Biodiversity Net Gain framework show that when governments embed native seed requirements into legislation and public investment, producers respond with innovation, scale, and long-term commitment. These systems do more than restore ecosystems; they link biodiversity recovery to rural economic development, agricultural diversification, and climate adaptation.

By contrast, Canada's native seed sector remains fragmented, undercapitalized, and structurally vulnerable. The absence of a national strategy, inconsistent provenance standards, limited processing and seedbank infrastructure, and short-term project-based procurement have created a widening gap between restoration ambition and seed supply capacity. This gap is now one of the most significant barriers to achieving national biodiversity and climate objectives. Addressing requires not incremental change, but integrated action across production, conservation, policy, and markets.

The integrated framework presented in this report identifies five interdependent pillars for action:

1. Strengthening producers support and shared infrastructure;
2. Establishing prairie-focused seedbanks linked directly to foundation seed supply;
3. Embedding provenance standards and procurement requirements into policy;
4. Expanding and diversifying markets for native plants beyond restoration alone; and
5. Building durable national coordination through producer-led networks and governance.

Together, these elements form a single system; one that must be developed intentionally and in parallel to succeed.

Canada's existing native seed producers have already demonstrated what is possible. Operating with limited support, they have supplied seed for restoration, stewarded rare species, supported Indigenous and community-led projects, and maintained genetic integrity across diverse prairie landscapes. They are not only suppliers, but innovators, educators, and custodians of prairie ecological knowledge. With the right policy signals, infrastructure investment, and coordinated networks, this sector can rapidly scale to meet national needs.

Ultimately, investing in a resilient native seed system is not solely a conservation action; it is a nation-building opportunity. It aligns biodiversity recovery with reconciliation, strengthens rural and Indigenous economies, supports climate adaptation, and embeds ecological stewardship into agriculture, urban development, and public infrastructure. If Canada acts decisively now, the seeds grown today by supported producers, conserved in seedbanks, and deployed through coordinated policy will secure the health, resilience, and prosperity of prairie landscapes and communities for generations to come.

This study reflects both international best practice and lessons learned from decades of prairie conservation, restoration and native seed production in Western Canada.

Figure 40. Five Pillars for Advancing Western Canada's Native Seed Industry.

5.0 GLOSSARY

5.1 Acronyms

The following acronyms are used throughout this report. They are provided to improve readability and consistency when referring to organizations, programs, policies, and technical terms related to native seed systems, ecological restoration, and conservation.

AAFC – Agriculture and Agri-Food Canada
BLM – Bureau of Land Management (United States)
BRN – Borderlands Restoration Network
CBD – Convention on Biological Diversity
CSGA – Canadian Seed Growers' Association
CWF – Canadian Wildlife Federation
DUC – Ducks Unlimited Canada
EU – European Union
ENSPA – European Native Seed Producers Association
ESG – Environmental, Social, and Governance
FAO – Food and Agriculture Organization of the United Nations
GBF – Kunming–Montreal Global Biodiversity Framework
GRIN – Germplasm Resources Information Network
IAE – Institute for Applied Ecology
ISCP – Indigenous Seed Collection Program (National Tree Seed Centre)
NESN – Northeast Seed Network
NLGRP – National Laboratory for Genetic Resources Preservation (United States)
NPGS – National Plant Germplasm System (United States)
NPMDP – Native Plant Materials Development Program (United States)
NSN – Native Seed Network (United States)
NSPC – Native Seed Producers of Canada
NTSC – National Tree Seed Centre (Canada)
PGRC – Plant Gene Resources of Canada
SER – Society for Ecological Restoration
SOS – Seeds of Success (United States)
SWSP – Southwest Seed Partnership
UK – United Kingdom
UNEP – United Nations Environment Programme
USDA – United States Department of Agriculture
USFS – United States Forest Service
VWW – Verband Deutscher Wildsamen- und Wildpflanzenproduzenten (Association of German Wild Seed and Wild Plant Producers)
WWF – World Wildlife Fund for Nature

5.2 Definitions

The following definitions are provided to clarify technical terms used consistently throughout this report and to support shared understanding among producers, policymakers, practitioners, and partners.

Accession - a distinct, uniquely identifiable sample of seeds representing a specific population collected at a particular time and place

Biodiversity -The variety of life at genetic, species, and ecosystem levels, including the diversity of native plants, animals, and ecological processes that sustain healthy, resilient landscapes.

Bonn Challenge – A global effort to restore 350 million hectares of degraded and deforested land by 2030, launched in 2011 and supported by multiple countries, including Canada.

Climate Change - Long-term changes in temperature, precipitation, and disturbance regimes that affect ecosystem function, species distributions, and the success of ecological restoration and native seed production.

Common Seed – Seed not produced under the pedigreed seed certification system; may still meet purity and germination standards but cannot be sold under a registered variety name.

Ecological Restoration – The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed, to re-establish its ecological integrity, biodiversity, and function.

Ecotype – A genetically distinct population within a plant species that has adapted to specific local environmental conditions. Using local ecotypes in restoration projects supports better survival, resilience, and ecological function.

Ecovar – A type of cultivated variety developed to represent the genetic diversity of a local population of a native species, usually sourced from wild populations and increased under cultivation while maintaining broad genetic representation.

Ex-situ Conservation - Conservation of genetic material outside its natural habitat, including seedbanks, living collections, and research repositories.

Foundation Seed - Early-generation seed derived from wild collections or seedbank accessions, used as starter material for seed increase while maintaining provenance and genetic diversity.

Genetic Diversity - The variation of genes within and among populations of a species, critical for ecological resilience, adaptation, and long-term restoration success.

Global Biodiversity Framework (GBF) – The Kunming–Montreal agreement adopted in 2022 under the Convention on Biological Diversity, setting global biodiversity targets to 2030, including restoration of degraded ecosystems.

Green Infrastructure - Natural and semi-natural systems, such as native grasslands, wetlands, pollinator corridors, and urban green spaces, that provide ecosystem services including flood mitigation, carbon storage, and biodiversity support.

Long-Term Procurement Contracts - Multi-year purchasing agreements that provide market certainty and enable producers to invest in infrastructure and capacity.

Millennium Seed Bank Partnership (MSBP) – A global seed conservation initiative led by the Royal Botanic Gardens, Kew, working with partners worldwide to collect and conserve wild plant seeds for future use.

Native Seed – Seed collected from plant species that are native to a specific region and have evolved alongside the local ecosystem. These seeds are adapted to local soil, climate, and ecological processes.

Native Seed Industry - The network of producers, processors, seedbanks, researchers, and distributors involved in the production and supply of native seed.

Native Seed Producers of Canada (NSPC) – An emerging national organization representing native seed growers, advocating for market development, policy support, and industry standards.

Nature-Based Solutions (NbS) - Actions that protect, manage, and restore ecosystems while addressing societal challenges such as climate change, biodiversity loss, and food security.

Pedigreed Seed – Seed produced under the Canadian Seed Growers' Association certification system, ensuring genetic purity and traceability through regulated production and inspection.

Procurement (Public Procurement) - Government purchasing policies and processes that influence market demand for native seed in publicly funded projects.

Producer Hub - A regional cluster or cooperative model providing shared infrastructure, training, and coordination for native seed producers.

Provenance-Based Seed - Native seed sourced from populations with documented geographic and ecological origin, selected to match local environmental conditions and maintain genetic integrity.

Provenance-Based Seed Zones – Geographically defined areas within which seed can be collected and used to ensure ecological adaptation and maintain local genetic integrity.

Reconciliation (in a conservation context) - Collaborative approaches that recognize Indigenous rights, knowledge systems, and stewardship roles in land and seed governance.

Regenerative Agriculture - An approach to agriculture that actively restores ecosystem function by improving soil health, increasing biodiversity, enhancing water cycles, and integrating

practices such as native grasslands, diverse plant communities, grazing management, and reduced disturbance.

Regiosaatgut – German provenance-based native seed certification system

Restoration Ecology – The scientific study and practice of repairing degraded, damaged, or destroyed ecosystems by reintroducing native species and restoring ecological processes.

Seed Certification – A process used to verify the identity, purity, quality, and provenance of seed, ensuring it meets specific standards for ecological restoration or commercial sale.

Seedbank – A facility or system designed to collect, clean, document, and store native seeds under controlled conditions for conservation, research, restoration, or future propagation.

Seed Multiplication – The process of increasing seed volume by growing out a genetically appropriate seed source in controlled or semi-wild production systems.

Seed Sovereignty – The right of communities, especially Indigenous Peoples, to save, use, exchange, and protect native seed according to their cultural values and ecological knowledge.

Seed Transfer Zone - A geographically defined area within which native seed can be moved and planted with minimal risk of maladaptation, based on climate, ecology, and genetic considerations.

Seed Zone – A designated geographic area within which plant material can be moved and used with low risk of maladaptation or loss of local genetic diversity.

Seedbank Viability – The ability of seeds stored in a seedbank to retain their germination potential over time, influenced by factors such as species, storage temperature, and seed moisture content.

Southern Alberta Native Seed Collaborative – A partnership of growers, researchers, and restoration practitioners working to increase the supply of locally adapted native seed in Southern Alberta.

Species at Risk (SAR) – Plant or animal species officially designated as threatened, endangered, or of special concern under national or provincial legislation due to population decline, habitat loss, or other threats.

Sustainable Agriculture - Agricultural practices that maintain soil health, biodiversity, and ecosystem function while supporting long-term productivity, including the integration of native plants for pollinator habitat, erosion control, and climate resilience.

Urban Greening - The use of vegetation, including native plants and seed, in urban and peri-urban environments to enhance biodiversity, manage stormwater, reduce heat, and improve human well-being.

US National Laboratory for Genetic Resources Preservation (NLGRP) – A federal facility in the United States that conserves plant and animal genetic resources, including native seeds, for research and restoration.

Wild Harvesting – The practice of collecting native seeds from natural populations in the wild, often guided by sustainable collection protocols to avoid negative impacts on donor sites.

6.0 REFERENCES

Alberta Agriculture and Forestry, Forest Division. 2016. Alberta forest seed transfer guidelines. Government of Alberta.

Allen, C. R., D. G. Angeler, A. S. Garmestani, L. H. Gunderson, and C. S. Holling. 2024. Restoration seed supply networks as complex social–ecological systems. Restoration Ecology, 32(1), e13924.

Biodiversify: www.biodiversify.com/what-is-biodiversity-net-gain. Accessed: December 16, 2025.

Borderlands Restoration Network website: www.borderlandsrestoration.org/nativeplantprogram. Accessed: August 6, 2025.

Bower, A.D., J.B. St. Clair, and V. Erickson. 2014. Generalized provisional seed zones for native plants. Ecological Applications

Bureau of Land Management. 2015. National native seed strategy for rehabilitation and restoration. U.S. Department of the Interior, Washington, DC.

Bureau of Land Management. 2021. National native seed strategy business plan update. U.S. Department of the Interior.

Canada Seeds Act. R.S.C. 1985. c. S-8. www.laws-lois.justice.gc.ca/eng/acts/S-8/page-1.html#h-446516. Accessed: June 10, 2025.

Canada Seeds Act, Seed Regulations. Amended 2025. C.R.C., c. 1400. www.laws-lois.justice.gc.ca/eng/regulations/c.r.c.,_c._1400/page-1.html#h-510302. Accessed: June 10, 2025.

CFIA Forward Regulatary Plan: 2025-2027. Website: www.inspection.canada.ca/en/about-cfia/acts-and-regulations/forward-regulatory-plan/2025-2027. Accessed: December 24, 2025.

Clewell, A., J. Aronson, and K. Winterhalder. The SER primer on ecological restoration. Society for Ecological Restoration Science & Policy Working Group, 2002.

Coastal Douglas-fir Conservation Partnership website: www.cdfcp.ca/species-at-risk-and-of-cultural-value-seedbank-gathering. Accessed: July 30, 2025.

Coleman, B. 2015. Building Blocks of Restoration: Plant Breeding and Genetics. www.pcap-sk.org/rsu_docs/documents/2015-Bruce-Coulman---breeding-native-grasses.pdf. Accessed: August 10, 2025.

Convention on Global Biodiversity. The Kunming-Montreal Global Biodiversity Framework. www.cbd.int/gbf. Accessed August 10, 2025.

Doke Sawatzky, K., and J.M. Piwowar. 2019. Changes in prairie grassland extent in Saskatchewan from 1990-2015. Prairie Perspectives: Geographical Essays, 21: 1-8

EDI Environmental Dynamics Inc. 2022. Meewasin Valley Authority Seed Bank Needs Assessment. Saskatoon, SK

Environment and Climate Change Canada. 2024. Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada. Gatineau, QC

Hammermeister, A.M., D. Gauthier, and K. McGovern. 2001. Saskatchewan's Native Prairie: Statistics of a Vanishing Ecosystem and Dwindling Resource. Native Plant Society of Saskatchewan Inc., Saskatoon, Saskatchewan.

European Native Seed Producers Association website: www.native-seed.eu Access: August 9, 2025

Gann GD, McDonald T, Walder B, Aronson J, Nelson CR, Jonson J, Hallett JG, Eisenberg C, Guariguata MR, Liu J, Hua F, Echeverria C, Gonzales, EK, Shaw N, Decleer K, Dixon KW. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology S1-S46.

German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Energy website: https://www.bundesumweltministerium.de/en/topics/nature-and-biological-diversity/translate-to-english-allgemeines-/-strategien/national-strategy. Accessed: August 15, 2025.

Government of United Kingdom. Understanding Biodiversity Net Gain. www.gov.uk/guidance/understanding-biodiversity-net-gain. Access: August 10, 2025

Grabbe, H., C. Mehlbaum, B. Heerma van Voss and S. van der Zwaag. 2025. Implementing the EU Nature Restoration Law: exploring pathways for member states. Working Paper 11/2025.

Hall, A., J. Nantais, S. Mullally, and S. Winterton. 2024. Southern Ontario Seed Strategy: Healing the Land Together in Partnership with Native Plants. Carolinian Canada.

Hammermeister, A., D. Gauthier, and K. McGovern. 2001. Saskatchewan's native prairie: statistics of a vanishing ecosystem and dwindling resource. Native Plant Society of Saskatchewan.

Institute for Applied Ecology website: www.appliedeco.org. Accessed: August 10, 2025.

International Network for Seed-based Restoration website: www.ser-insr.org. Accessed: August 10, 2025.

Meewasin Valley Authority. 2025. Native Plant Seed Bank – Strategic Plan. Saskatoon, SK.

Murray, S., R. Lazarus, and D. Desmarais. 2024. Native Seed Strategy: Restoration in Manitoba – 2024. Winnipeg, MB.

National Academies of Sciences, Engineering, and Medicine. 2023. An Assessment of Native Seed Needs and the Capacity for Their Supply: Final Report. Washington, DC: The National Academies Press.

National Native Tree Seed Center website: www.natural-resources.canada.ca/science-data/science-research/research-centres/national-tree-seed-centre. Accessed: July 30, 2025.

Native Plant Materials Development Program website: www.blm.gov/programs/natural-resources/native-plant-communities/native-seed-and-plant-material-development. Access: August 7, 2025.

Native Plant Society of Saskatchewan. 2024. Native plant market assessment for Saskatchewan. Saskatoon, SK.

Native Seed and Plant Development Program website*:* www.blm.gov/programs/natural-resources/native-plant-communities/native-seed-and-plant-material-development. Accessed: August 7, 2025.

Native Seed / SEARCH website: www.nativeseeds.org. Accessed: August 18, 2025.

Nelson, C.R., Hallett, J.G., Romero Montoya, A.E., Andrade, A., Besacier, C., Boerger, V., Bouazza, K., Chazdon, R., Cohen-Shacham, E., Danano, D., Diederichsen, A., Fernandez, Y., Gann, G.D., Gonzales, E.K., Gruca, M., Guariguata, M.R., Gutierrez, V., Hancock, B., Innecken,

P., Katz, S.M., McCormick, R., Moraes, L.F.D., Murcia, C., Nagabhatla, N., Pouaty Nzembialela, D., Rosado-May, F.J., Shaw, K., Swiderska, K., Vasseur, L., Venkataraman, R., Walder, B., Wang, Z., & Weidlich, E.W.A. 2024. Standards of practice to guide ecosystem restoration – A contribution to the United Nations Decade on Ecosystem Restoration 2021–2030. Rome, FAO, Washington, DC, SER & Gland, Switzerland, IUCN CEM.

Northeast Seed Network website: www.northeastseednetwork.org. Accessed: August 7, 2025.

Olwell, P. and S. Bosak, 2015. National Native Seed Strategy Business Plan 2015-2020.

Pedrini, S. and K.W Dixon. 2020. International principles and standards for native seeds in ecological restoration. Restoration Ecology: 28: S286-S303.

Perkins, L, A. Symstad, J. Zavaleta-Cheek, E. Rohrer, and K. Ehlert. 2024. Northern Great Plains Native Seed Strategy. Native Plant Initiative Newsletters and Reports.

Plant Gene Resources of Canada website: www.agriculture.canada.ca/en/science/collections/plant-gene-resources-canada Accessed: July 30, 2025

Prasse R, D. Kunzmann D, and R. Schröder. 2010. Development and practical implementation of minimal requirements for the verification of origin of native seeds of herbaceous plants (in German). In Cooperation with Verband Deutscher Wildsamen- und Wildpflanzenproduzenten. DBU, reference no. 23931

Pollinator Paradise YXE website: www.wildaboutsaskatoon.org/pollinator-paradise-yxe. Accessed: August 26, 2025.

Powter, C.B. and A. Smreciu, 2025. Southern Alberta Native Seed Collaborative Native Seed Market Needs and Capacity Assessment. Prepared by Enviro Q&A Services and Wild Rose Consulting Inc., Edmonton, Alberta for the Grassland Restoration Forum.

Ren, H., and A. Antonelli. 2023. National botanical gardens at the forefront of global plant conservation. Innovation.

Riley, J.L, S.E. Green, and K.E. Brodribb. 2007. A Conservation Blueprint for Canada's Prairies and Parklands. Nature Conservancy of Canada.

Roch, L. and J. Jaeger. 2014. Monitoring an ecosystem at risk: What is the degree of grassland fragmentation in the Canadian Prairies? Environmental Monitoring and Assessment 186: 2505-34.

Saskatchewan Ministry of Environment. 2025. Saskatchewan Prairie Landscape Inventory Technical Summary. www.publications.saskatchewan.ca/#/products/127095 Accessed: December 15, 2025.

Sawatzky, K.D. 2019. The State of Native Prairie in Saskatchewan. Blue Jay.

Scholtz, R., & D. Twidwell. 2022. The last continuous grasslands on Earth: Identification and conservation importance. Conservation Science and Practice: 4(3), e626.

Seeds of Success website: www.blm.gov/programs/native-plant-communities/native-plant-and-seed-material-development/collection/sos. Accessed: August 7, 2025.

Southwest Seed Partnership website: www.southwestseedpartnership.org. Accessed: August 15, 2025.

Spearing, M., McPhee, D., and Loo, J. 2023. Sizing Canada's National Seed Supply Chain: Preliminary Assessment focused on Trees and Shrubs. Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre. Interim Report.

Statistics Canada. Table 32-10-0043-01Forage seed usage by type of seed. www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3210004301. Accessed August 9, 2025.

Sveinson, J.M. 2003. Restoring Tallgrass Prairie in Southern Manitoba, Canada. University of Manitoba.

Tree, I. 2018. Wilding: the return of nature to a British farm. Picador.

USDA-ARS Germplasm Resources Information Network website: www.ars-grin.gov. Accessed: August 23, 2025.

Verband deutscher Wildsamen- und Wildpflanzenproduzenten (VWW) website: www.natur-im-vww.de/en. Accessed: August 9, 2025.

Volk, G. M., D. Carver, B. M. Irish, L. Marek, A. Frances, S. Greene, S, C.K. Khoury, J. Bamberg, A. del Rio, M.L. Warburton, and P.K Bretting, P. K. 2023. Safeguarding plant genetic resources in the United States during global climate change. Crop Science, 1–23.

Walder, B., Wang, Z., & Weidlich, E.W.A. 2024. Standards of practice to guide ecosystem restoration – A contribution to the United Nations Decade on Ecosystem Restoration 2021-2030. Rome, FAO, Washington, DC, SER & Gland, Switzerland, IUCN CEM.

White, F.J., A. Ensslin, S. Godefroid, A. Faruk, T. Abeli, G. Rossi, and A. Mondoni. 2023. Using stored seeds for plant translocation: The seed bank perspective. Biological Conservation 281: 1-8.

Willamette Valley Native Plant Partnership. Website: www.appliedeco.org/restoration/native-seed-partnership/willamette-valley-native-plant-partnership. Accessed: August 10, 2025

Woosaree, J., 2000. Market Assessment of the Native Plant Industry in Western Canada. Prepared for Alberta Environment and Alberta Agriculture, Food and Rural Development by Alberta Research Council, Vegreville, Alberta. Report # ESD/LM/00-2.

WWF Canada Seed Orchard Program website: www.wwf.ca/seed-orchards. Accessed: July 31, 2025.

Personal Communications

Abbandonato, H. Canadian Wildlife Federation. Personal communication. July 31, 2025.

Demeters, A. BrettYoung Seeds. Personal communication. July 14, 2025.

Mackenzie, M. InnoTech Alberta. Personal communication. August 11, 2025.

Olwell, P. U.S. Bureau of Land Management (retired). Personal communication. October 3, 2025.

Relf-Eikstein, J. Saskatchewan Forage Seed Development Commission. Personal communication, February 21, 2024.

7.0 APPENDICES

APPENDIX A: Nuffield Research Project – Travel Log

Country	Travel Dates	Destination	Visit / Conference	Key Insights
Brazil	March 9 – 17, 2024.	Campo Grande, Mato Grasso do Sol	Bioparque Patanal	As part of the Nuffield Contemporary Scholars Conference (CSC), it was located at the Bioparque Pantanal. There was an interactive display with native seeds of the Pantanal, with an Elder talking about the seeds and their uses.
			SENAR/MS Centre of Excellence	As part of the Nuffield CSC, a tour to this research facility. Discussions with the researchers regarding the development of native grass forage breeding instead of using species from Africa. Discussed the Canadian and US breeding programs.
		Bonito, Mato Grasso do Sol	Sidrolandia	Local subsistence farmers who have created a cooperative to sell fruit from trees on their small farms. Several native species grown. Some discussions with the locals regarding their use of native species and the market potential
			Aldeia in Nioaque	A local Indigenous community wild harvesting fruits, berries and seeds. Harvesting tree seeds sold into a cooperative for forest restoration projects. (Note: At the National Native Seed Conference in Tuscon, Arizona – met the coordinator who is working with Indigenous communities to harvest tree seeds for restoration)
			Recanto Ecológico Rio da Prata	Toured this eco-tourism-based farm and had discussions with the owners daughter regarding forest restoration and watershed management projects the farm is involved with. They have their own tree nursery where they collect seeds from the forest, start them in their nursery, and then plant them out on the property in hayfields and pastures to create habitat. Tree planting is part of paid experiences. Interesting opportunity to incorporate farming, eco-tourism, and habitat restoration.
		Pantanal, Mato Grasso do Sol	Fazenda São Francisco Fazenda Bodoquena Fazenda São José in Aquidauana	Visited three farms as part of the Pantanal tour, two of which had eco-tourism businesses. It is interesting to see how these farms have developed eco-tourism businesses and balancing predator/prey relationships with Jaguar and other species.

Canada	December 11 – 7, 2022	Montreal, Quebec	COP-15 UN Biodiversity Conference	● I witnessed the negotiations of the Global Biodiversity Framework, a landmark global commitment to halt and reverse biodiversity loss by 2030. ● From the debates on Target 2, I learned the importance of restoring 30% of degraded ecosystems, including grasslands, using native seed systems and local stewardship. ● In discussions on Target 4, I saw how seedbanks, genetic diversity, and Indigenous-led approaches are central to preventing extinctions and building resilience. ● Attending COP-15 began the formulation of my Nuffield Canada question – the need to grow the native seed industry to meet Target 2
	June 11-15, 2023	Quebec City, Quebec	Society for Ecological Restoration, Eastern North America Conference	● I witnessed the creation of the Quebec City Declaration on the UN Decade on Ecosystem Restoration which declaration reaffirmed Canada's commitment to achieving Global Biodiversity Framework Target 2, namely restoring 30% of degraded terrestrial, water, and coastal ecosystems by 2030. ● As a native seed producer, Canada's commitment to Target 2 will require large, consistent volumes of locally adapted native seed will require significant growth in the industry and therefore expanded markets and procurement opportunities ● Met with several native seed producers from across Canada, where we discussed the need to create a native seed producers association as a voice for the native seed industry, due to interest from various groups to create a national seed strategy, restoration standards, provenance standards, and labeling standards. ● Attended a workshop hosted by the National Tree Seed Center regarding Indigenous tree seed harvesting and seedbanking, to understand better the NTSC programs and their seedbank ● Attending SER-Eastern North America and witnessing the Quebec City Declaration, formalized my Nuffield Canada question – the need to grow the native seed industry to meet Canada's international commitments.
	June 29-30, 2023	Manitoba	Prairie Originals (Selkirk, MB)	● Met with Kelly Leask, a native plant producer with some native seed production in Manitoba, to visit her wildflower plant production, her on-farm sales center, seed production plots and future location ● Discussed the native seed and plant industry, discussing partnership opportunities with native plant producers

			Skinner Native Seeds (Roblin, MB)	● Met with John Skinner, a native seed and plant producer in Manitoba, to visit his operation including native grass production fields, seed cleaning facilities, and wildflower seed production plots. ● Discussed the native seed and plant industry, discussed partnership opportunities between producers
	November 16-17, 2023	Claresholm, Alberta	Grassland Restoration Forum / Southern Alberta Native Seed Collaborative (SANC)	● Participated in the discussions for the SANC strategic planning for the organization, including providing a Saskatchewan perspective as a seed grower, providing inspiration for creating a Manitoba-Saskatchewan Native Seed Collaborative ● Discussions on practical producer and policy insights from Alberta that can inform your recommendations for scaling seed supply and integrating Indigenous-led and conservation-focused initiatives across the Prairies.
	December 6-7, 2023	Swift Current, SK	Transboundary Grasslands Partnership	● Attended the workshop to connect with researchers at AAFC Swift Current and their native plant breeding program, connected with users of native grass seed for restoration projects and discuss my Nuffield Canada project.
	February 7-8, 2024	Saskatoon, SK	Native Prairie Restoration and Reclamation Workshop	● Was the opening plenary speaker, discussing the last 30 years of the native prairie restoration in Canada; where things have gone (or not gone); also gave a presentation on seed banking ● From this workshop, I took away the critical importance of developing a coordinated prairie-focused seed system anchored by seedbanks, producer networks, and Indigenous leadership to ensure reliable, ecologically appropriate seed for large-scale restoration.
	June 28-29, 2024	Manitoba	Living Prairie Museum (Winnipeg, MB)	● Visited this remnant tallgrass prairie preserve in the middle of Winnipeg, looking at their education and outreach on native plants, their landscaping with native plants, and their production greenhouse for wild seed collected on site, grown in their small greenhouse and then replanted out. ● Examined their land management practices including prescribed fire and targeted grazing with sheep.
			Prairie Originals (Selkirk, MB)	● Met with Kelly Leask, a native plant producer with some native seed production in Manitoba, to visit her wildflower plant production, her on-farm sales center, seed production plots and future location

				● Discussed the native seed and plant industry, discussed partnership opportunities with native plant producers, and her sales at the local farmers market
			Prairie Flora Greenhouse (Tuelon, MB)	● Met with Aimee McDonald, a native plant producer with some native seed production in Manitoba, to visit her wildflower plant production, her on-farm sales center ● Discussed native plant production, her work with Living Prairie Museum in Winnipeg for a sales outlet and working with other native plant producers to grow the native plant industry.
			The Leaf (Winnipeg, MB)	● Visited Winnipeg's new Botanical Gardens with landscaping with native plants on the exterior and some limited native plants on the interior. Potential ideas for a future botanical garden in Saskatoon tied to a seedbank.
	October 28 – November 1, 2024	British Columbia	NATS Nursery (Langley, BC)	● Toured NATS Nursery, as part of SER tour, with NATS nursery staff Ron Jacobson and Jennifer Adhika. Learned about their native plant greenhouse production (mainly trees and shrubs), willow live-staking nursery, green-roof product and toured their seed cleaning facility and storage facility ● Discussions after the tour regarding markets in BC, their partnerships with First Nation communities, and development of producer networks
			Pacific Spirit Regional Park (Vancouver, BC)	● Participated in an afternoon tour of this natural park as part of the SER Conference. I learned about their restoration projects on site. Participated in the planting of native trees and shrubs to restore a disturbed area under a power line.
			Society for Ecological Restoration, North America Conference (Vancouver, BC)	● Connected with various groups and individuals involved in the North American native seed industry including Northeast Seed Network, International Network Seed-based Restoration, and Canada's National Native Seed Strategy, key side discussions and presentations ● Discussions with native seed producers regarding regional and national producer associations and connected with people on seed banking project.
			Stanley Park (Vancouver, BC)	● A short tour of Stanley Park as part of the SER tour. Learned about ongoing land management and restoration programs at Stanley Park.
	December 4,2024	Saskatoon, SK	Plant Gene Resources Center	● Toured PGRC with representatives from Meewasin, Wanuskewin Heritage Park and Nature Conservancy of Canada, lead by Dr. Axel

				Diedrichsen, to look at the PGRC seedbank operation and discuss partnership opportunities for a the Meewasin Seedbank project ● Reviewed collection protocols, grow-out protocols, seed cleaning and storage facilities, and future plans for growth of the PGRC
	February 12-14, 2025	Regina, SK	Native Prairie Restoration and Reclamation Workshop	● The workshop highlighted the value of integrating science, Indigenous knowledge, and producer experience to tackle prairie restoration challenges like invasive species, soil health, and economics directly relevant to shaping Western Canada's native seed markets. ● I presented on my Nuffield travels and shared lessons from European seedbanks and producers, emphasizing provenance standards, networks, and restoration-driven systems as models for Canada
	June 27 – 30, 2025	Alberta	ALCLA Native Plants (Carstairs, AB)	● Met with Latifa Pelletier-Ahmed and Ben Haitch to tour their new farm; their on-farm sales location, their greenhouses, seed storage and cleaning. ● Discussing the native seed and plant industry, discussed partnership opportunities between producers.
			EcoLogic (Strathmore, AB)	● Met with Kaitlin Mercier and Nathan Gill to tour their production facility including their NatureTurf product, their willow live-staking nursery, and their seed storage facilities. Discussions regarding their urban landscaping projects with native species. ● Discussing the native seed and plant industry, discussed partnership opportunities between producers.
			East Slopes Rangeland Seeds / Tannas Conservation Services (Cremona, AB)	● Met with Kristen and Steve Tannas and Steve's father Claire Tannas at their farm near Cremona. Toured their greenhouse facilities (including their new passive solar greenhouse), Foothills Fescue plug production, their native aquatics, and other projects on site ● Discussed the native seed and plant industry, discussed partnership opportunities between producers. ● Discussions about the native grass seed industry that collapsed in the early 2000s with the flood of publicly released cultivars on the market, which had major impact to East Slopes Rangeland Seeds.
			Olds College Botanical Gardens (Olds, AB)	● Visited the Botanic Gardens and manufactured wetlands at Olds College. Interpretive signage, native plant landscaping, and the use of native aquatic plants for storm water and waste water management.
			Trochu Arboretum (Trochu, AB)	● A local arboretum started over 100 years ago, with interpretive signage and public space. Provides opportunity to engage the public with the

				development of a botanical garden / arboretum to educate about plant species.
			Wild About Wildflowers (Black Diamond, AB),	● Met with Arden Nering at her on-farm sales location. Toured her greenhouse and sales area. ● Discussing the native seed and plant industry, discussed partnership opportunities between producers.
	October 29-30, 2025	Nature Restoration Forum	Ottawa, ON	● A 2-day Summit hosted by the World Wildlife Fund Canada to discuss growing the restoration efforts across Canada to meet the Global Biodiversity Framework 30x30 challenge ● Several native seed producers and seed-based restoration practitioners present, having discussions on restoration
		Canadian Wildlife Federation	Kanata, ON	● Met with Carol Callahan, Tracey Etwell and Ginette Hupe at Canadian Wildlife Federation's national office to discuss the National Native Seed Strategy and other programs. ● Met with CWF CEO Sean Southey to discuss growing the native seed industry in the prairies.
	November 21, 2025	Grasslands National Park	Val Marie, SK	● Toured Parks Canada native seed cleaning and storage facilities in Val Marie, SK.
England	July 22-28, 2025 August 4-18, 2025	Brighton	Royal Pavillion	● Toured the grounds of the Royal Pavillion (palace) at Brighton. Several landscaping features with native plants on the site, with pollinator habitat signage.
		Bristol	Meadowmania	● Met with Julie Powers with Meadowmania (UK) and Connecting to Nature (Ireland) to discuss Arvum Groups business model, the different focuses of each company, their partnerships with native seed producers, and their marketing approach for native seed. Discussed difficulties getting into the native seed industry in England and the secretiveness of the industry
		Chinchester	Fishbourne Roman Palace	● Toured the site, which contained a garden of "wild herbs" which are local English wildflowers. Signage discussed the use of the many species for herbs or for food.
			Weald & Downland Living Museum	● Toured the site, which contained a garden of "wild herbs" which are local English wildflowers. Signage discussed the use of the many species for herbs or for food.
		Dial Post	Knepp Estate	● Participated in a 1-day workshop on Wilding with Tony Whitbread and Laurie Jackson. Workshop included different aspects of planning for wilding projects, natural processes, usage of various grazing animals to

				manage the landscape, and options for economic development of wilding projects. Workshop included an afternoon walking tour of portions of the Estate to see the various aspects of the wildling project and natural recovery. ● Attending an evening dinner hosted by estate owner Charles Burrell, where he discussed wildling projects. Had a discussion with him regarding my Nuffield project and restoration as part of wilding efforts.
		King's Lynn	Emorsgate Seeds	● Met with Mark Schofield with Emorsgate seeds. Toured the seed cleaning facilities, seed harvesting equipment, seed drying areas, seed storage areas (including freezers) and seed packaging areas ● Discussion with Mark regarding the English native seed industry, seed provenance, seed traceability, and also the impacts of seed imports from outside of UK.
		Langar	Naturescape Wildflower Farm	● Visted the Naturescape Wildflower Farm. Farm is set up with hiking trails through and around the wildflower seed production fields, with signage identifying each species. The Farm has a tea room and restaurant, playground, small sales greenhouse, and on-farm sales for native seeds and plants. Interesting model to have public access to the site and making it a farm experience.
		Liverpool	World Museum	● Visted the World Museum with a wildflower meadow in front of the building, with numerous interpretive panels explaining the project and how to make a meadow.
		London	Buckingham Palace	● On the grounds of Buckingham Palace, there are several wildflower meadows planted, with interpretive signage
			Farmers Club	● Visited the Farmers Club in London
			St. Jame's Park	● Several planting beds of wildflowers, pollinator habitat, and naturalized shoreline within the park, including excellent interpretive signage for the public.
		North Pennines National Landscape	Bowlees Visitor Center	● Dan Carne, Churchill Fellow, introduced me to Paul Muto who works with the North Pennines National Landscape. Toured their small native plant nursery with two small greenhouses that use native seed collected from the site, by volunteers, and is planted back out onto the site.
			River Tees – Low Force and High Force Waterfalls	● Walked to the Low and High Force Waterfalls with Dan Carne and Paul Muto, discussing various aspects of restoration, native seed industry, wildling programs, and meadowmaking in England. Visited several

				restoration projects along the way plus numerous natural meadows with wildflowers.
		Nottingham	Nottingham Castle	● Visited Nottingham Castle, with some interpretive signage about native plants and pollinators at the site.
		Pentworth	National Trust – Pentworth House	● Visited the Pentworth house, with several "wildflower meadows" planted in the gardens with interpretive signage regarding the process of creating meadows and the importance of pollinators
		Richmond	Telfit Farms	● Dan Carne introduced me to Richard Bourne-Arton with Telfit Farms, a 2,000-acre estate where he is setting aside some land for different BNG (Biodiversity Net Gain) projects. He has set up a "Cricket Bat" plantation of *Salix alba* as a woodmeadow project and is looking at other woodmeadow projects. ● He is also looking at some wildflower meadows and also is interested in getting in the native seed business. Discussion regarding the challenges of getting into the industry and the "secrecy". Shared information with Richard regarding our operation and different approaches by producers in Canada.
		Wakehurst	Kew Gardens – Wakehurst	● Toured the botanical gardens and met with the landscaper who lead the project on "the North American grasslands" demonstration garden – a 7 acre "prairie" demonstration. Discussed what a prairie is, what is looks like, and how they can enhance the site to look more natural (e.g. more grass species)
			Millennium Seedbank	● Met with Michael Way who is the Director of America's programs with MSBP. Toured the facilities including research labs, public engagement spaces, demonstration gardens, and the seed vaults. ● Discussions regarding MSBP international programs, research programs, international standards and partnerships with other seedbanks around the world. Shared resources and information to help build a seedbank in Western Canada.
		West Tanfield	Nosterfield Quarry and Nature Preserve	● Visited this old granite quarry with Dan Carne, where projects are underway to restore the quarry to wetland species. There is a nursery on site with native aquatic species where they manage water amounts in each bed to simulate "draw down".
		Worthing	Marine Gardens	● An art installation around a building called "Wildling Worthing" with wildflowers planted and paintings showing the different species, with description of each species.

			National Trust – Cissbury Ring	● Visited the site and the walking paths, with random "bee hotels" and other features added with small "meadow plantings", with signage describing the project.
			Wallace Ave Park	● A small park adjacent to the English Channel with a "wildflower meadow" created.
		Yorkshire Dales National Park	Grouse Moors Area	● Visited several woodmeadow making projects in the Grouse Moors area with Dan Carne. He explained the woodmeadow and wildflower meadow making processes and the work he is doing with Woodmeadow Trust and other groups to do projects across England and the UK ● Dan Carne was a 2024 Churchill Fellow who had just completed his 9-week travels across Europe visiting people regarding their woodmeadow making projects.
Estonia	August 24 - 31 2024	Tallin	Butterfly Pathway	● City of Tallin has a Butterfly Pathway connecting greenspaces throughout Tallin to the countryside for pollinators and butterflies to move in and out of the city, with numerous display areas including at the Tallin train station.
		Tartu	Landscaping with Native Plants - Various	● Throughout Tartu there are numerous plantings of native species, including art displays, pollinator habitat creation, and the boulevard between sidewalks and streets planted to native species. Numerous locations with signage and/or interpretive panels describing the project.
			Nordic Botanicals	● Toured Nordic Botanicals as part of the SERE tour. Site has 5 acres under native seed production with a wild harvesting program. Toured the seed plots, harvesting equipment, greenhouse and seed cleaning facility. Discussed the history of the business (a social enterprise of University of Tartu) and how they filled a niche due to no existing native seed producers in Estonia. Discussion with the group regarding harvesting equipment and seed cleaning equipment – same challenges as Canada seed growers.
			Society for Ecological Restoration, Europe Conference	● Attended the SERE conference to learn about various aspects of restoration programs, EU legislations, wilding programs, meeting with numerous native seed producers from across Europe, and also seed banking programs in Europe. Conference provided excellent context for the European industry and restoration programs but also made excellent connections practitioners in restoration and growers in the industry. ● Spoke on an international panel regarding native seed producers.

			University of Tartu Botanical Gardens	● Botanical gardens have a display area where they have each biome of Estonia represented in a "bed" with interpretive signage on each biome and labels for each plant. 50% of all the native plant species of Estonia were represented in this area. Provides a great example of how botanical gardens can be used to showcase native species.
Ireland	July 28 – July 31, 2025	Ballymountain	Arvum Group / Connecting to Nature	● Sandro Cafola with Design by Nature introduced me to Roy Power (Chairman of Arvum) and Paul Flanagan (Group CEO) of Arvum Group. Discussed Arvum's business venture into Connecting to Nature (Ireland) and Meadowmania (England) and their partnership with Design by Nature. ● Visited their wildflower seed production plots, seed cleaning facilities, and their storage / packaging area. Discussed specializing in producing the "easy to grow species" at a larger scale with Sandro focusing on the more difficult and unique species. Discussed the marketing aspect of the company as well.
		Carlow	Design by Nature	● Toured Sandro Cafola's family farm including seed production, greenhouses, and seed cleaning facilities. Toured several seed production fields and wildflower meadows that were being harvested. Detailed discussions on the Irish native seed industry, various restoration projects in the country, the concept of "living seedbank", and future plans for the business. ● Learned about the "Yellow Rattle" market, a saprophytic annual plant, that suppresses grasses and allows annual and perennial wildflowers to grow to make "wildflower meadows".
		Dublin	St. Patrick's Cathedral	● Visited St. Patrick's Cathedral with several "wildflower meadows" and landscaping with native plants for pollinator habitat. Several interpretive signs are installed in the area.
			Trinity College – Botanical Gardens	● Visted the small botanical gardens see their greenhouse, demonstration beds, and interpretive signage, including information on their seedbank program for rare Irish plants
			Trinity College - Campus	● Visited the Trinity College campus and found numerous "wildflower meadow" plantings, interpretive signage throughout the campus on wildflowers and pollinators and "green walls" on the sides of buildings.
Germany	August 19 – 23, 2025	Blaufelden	Rieger-Hofmann	● Met with Ersnt Rieger who provided a tour of his family-owned operation. Showed seed cleaning facilities, seed production fields, harvesting equipment, seed storage facilities, seed packaging facilities,

				inventory control and tracking systems. Lengthy discussions on the European native seed industry, German seed industry, the VWW and ENSP, seed provenance, seed zones and the complexities of 22 seed zones, working with 100 other seed producers, the market volatility in Germany, wild harvesting seed for increase, and exporting seed into the EU. Very insightful discussions. Talked about his succession plans to transfer the business to his two sons.
		Hannover	Eilenride Urban Forest	● Visited this 1,600-acre urban forest with 140 km of hiking trails, that was sold to the City of Hannover in 1371 and has been managed as a forest reserve since 1800s. Various projects to maintain the forest, restore degraded areas, and interpretation programs. Connecting natural spaces within the area as well into this larger forest – a model for other urban areas with natural spaces.
			Landscaping with Native Plants - Various	● Throughout the streets of Hannover, various landscaping projects with native species including wildflower meadows in cemeteries, "green-roofs" on garbage can stands and buildings, wildflower plantings along sidewalks; all integrated into the communities.
		Osnabruck	University of Osnabruck – Botanical Gardens	● Met with Dr. Sabrine Zachgo, Curator of University of Osnabruck's Botanical Gardens. Had a tour of the botanical gardens, along with seedbank. Gardens are part of an old quarry with different "biomes" of plantings from around the world, including different biomes of Germany, with interpretive panels. Several areas of wildflower meadows and also display areas of different native species and their uses medicinally.
			University of Osnabruck - Seedbank	● Dr. Zachgo toured the seedbank and laboratory space. As part of the discussions discussed the seedbank program in Germany (1 of 4 targeting native species), their prioritization process for species collection, the hiring of contractors to collect seeds, and shared numerous resources for the Meewasin seedbank.
		Staubing	ESKUSA	● Met with Dr. Fred Eickmeyer who owns ESKUSA. He is a plant breeder working with numerous native species for projects including Russian Dandelion for latex content for tires, Arica for pharmaceutical industry, Common Tansy for biofuels, and Nettle for hemp replacement. Toured his greenhouses, production fields, seed cleaning and harvesting facilities, and his labs. He discussed his breeding program, working

				with seedbanks to source seeds, the native seed industry, and the technical support provided to producers growing species out for him.
Latvia	August 28, 2024	Zuldinas area, Valka County	Nature Farm BEKAS Farm	● As part of a SERE tour, met with Viesturs Lārmanis, owner of the Nature Farm BEKAS. Farm has funding from EU Life Program to do rewilding, meadowmaking (wildflower and woodmeadow) and agri/eco-tourism projects. Tour included presentations, a walking tour of various projects. BEKAS farms is one of the most ecologically diverse farms in Latvia with numerous representative biomes located on the farm.
Northern Ireland	July 31 – August 3, 2024	Belfast	River Lagan – Parkways	● The parkway along River Lagan, numerous plantings of native wildflowers with interpretive signage along the river.
			Ulster Botanical Gardens	● Visited the Ulster Botanical Gardens, with numerous plantings of "pollinator habitat" including native trees, shrubs and wildflowers with interpretive signage.
			World Museum	● Visited the museum with a large wildflower meadow planting outside the building with interpretive panels. Museum had an exhibit about bees and pollinators with information on wildflowers and wildflower meadows. ● The installation is called "Wildflowering in the City"
United States	February 17 – 27, 2025	Arizona	Biosphere 2 (Saddlebrooke, AZ)	● Toured the Biosphere 2 site. While on site, I observed a series of native plant landscaping and interpretive signage which was incorporated into the story of Biosphere 2.
			Borderland Nursery and Seedbank (Patagonia, AZ)	● Toured the seedbank, nursery, seed cleaning and greenhouse operations with Francesca Clavierie. Discussed Borderlands Restoration Network and their NGO model with seed nursery, restoration work and other projects. Discussed their sales of plants and seeds, and how it goes back into the NGO and their consulting work.
			Boyce Thompson Arboretum (Phoenix, Arizona)	● Visited the arboretum to learn about local biodiversity. Location provides unique interpretive opportunities for the public about desert native flora. ● Discussed with staff about the Arboretum's seedbank program and collections, including trading with other seedbanks for species to add to the arboretum.
			Desert Botanical Garden (Phoenix, AZ)	● I visited the botanical garden to learn about local biodiversity. Location provides unique interpretive opportunities for the public about desert native flora.

			Native Seed SEARCH (Tucson, AZ)	● Met with Helena Gonzales and had a tour of their seedbank facility, field production, seed cleaning. Discussions on their seedbanking operation and working with farmer growers (to grow out species) and local collectors for certain species. Discussed their program model their training programs for the public.
			National Native Seed Conference (Tucson, Arizona)	● Conference provided an opportunity to connect with numerous groups and people involved with the native seed industry from the International Network of Seed-based Restoration to Northeast Seed Network, Williamette Valley Native Plant Partnership, ● Discussions with the Canadians at the conference regarding native seed networks and producer associations. ● Spoke on an international panel about native seed producers and networks.
			Phoenix Mountain Preserve (Phoenix, AZ)	● Visited this natural area in Pheonix and met with a local park ranger; discussed land management issues in the park and restoration requirements and challenges faced with restoring in this ecosystem.
			Sonora Desert Museum (Tucson, AZ)	● Visited this natural area / museum in the Sonora Desert. Interpretive signage on native species and plantings, including pollinator habitat, pollinator waystations, and other interpretive programs.
			Spadefoot Nursery (Tucson, AZ)	● Met with Katy from Spadefoot at their sales center / greenhouse in Tucson. Discussed their production, wild seed collecting, the industry in Arizona, multi-generations (her father was growing native species), working with NGOs like Native Seed/SEARCH
	July 21-25, 2025	Nebraska	Sandhill Crane Trust (Wood River, NE)	● Visted the Sandhill Crane Trust, with numerous displays of native wildflowers and tallgrass prairie plantings, with interpretive signage. Restoration of the site includes tallgrass prairie restoration with Plains Bison grazing.
			Platte River Prairies (Wood River, NE)	● Toured The Nature Conservancy's site where a series of tallgrass prairie restoration projects have occurred over the last 20+ years. Discussions on management of the restoration projects.
			Heltzer Family Prairie (Stockham, NE)	● Toured Chris Heltzer's family prairie site which had restoration done in the 1960s and also in the last 5 years. Oldest restoration site that I have seen and interesting to see the diversity of an old 5 species mix after 6 decades of naturalizing. Discussions on the native seed industry in Nebraska and planting high diversity mixes (200+ species) with the latest restoration parcel.

		North Dakota	Teddy Roosevelt National Park	● Stopped at the main viewing areas at TRNP, with Plains Bison grazing. Several interpretive signs talking about native prairie and restoration within the National Park.
		South Dakota	Mount Rushmore (Keystone, SD)	● Display at the entrance into Mount Rushmore showcasing wildflower species with Indigenous interpretation of each species, as part of the display
	September 29 – October 5, 2025	Colorado	Society for Ecological Restoration, World Conference (Denver, CO)	● Attended the SER World Conference, attending numerous sessions and symposia on native seeds. Numerous topics from around the world on seedbanking, native seed production, United States seed programs ● Attended the Internation Seed-based Restoration Chapter of SER annual meeting
			USDA-ARS National Laboratory for Genetic Resources (Fort Collins, CO)	● Toured the main USDA seedbank including research labs, cryogenic and long-term storage facilities. Discussions on seedbanking around the world and the role the facility played with the US Seeds of Diversity project and their connection to worldwide seedbanks.
			Denver Botanical Gardens (Denver, CO)	● Visted the Denver Botanical Garden; numerous unique areas established to showcase the flora of Colorado including a 7-acre native prairie restoration and the Mordecai Children's Garden which showcases six unique ecosystems in Colorado while providing hands-on learning opportunities for children to learn about native plants.
	December 2-6, 2025	Louisianna	International Fire Ecology and Management Congress (New Orleans, Louisianna)	● Attended the conference for prescribed fire, however three symposia focused on native seed and restoration post prescribed fire. One symposium focused on native seed sourcing for restoration while two symposia focused on modeling seed sources for future restoration post-fire in forested ecosystems under climate change models.
		Mississippi	Mississippi Sandhill Crane National Wildlife Refuge (Biloxi, Mississippi)	● Toured the National Wildlife Refuge to discuss prescribed fire and restoration efforts at the site

Figure 39. My Nuffield Canada Agriculture Scholarship Travels - 2023 to 2025

APPENDIX B. Presentations Provided Regarding My Nuffield Canada Project (To January 2026)

Topic / Presentation Title	Location	Conference / Event	Date
Navigating the Prairie Horizon: 30 Years of Prairie Restoration in Saskatchewan	Saskatoon, SK	Native Prairie Restoration and Reclamation Workshop	February 8, 2024
Growing the Native Seed Industry and the Need for a Native Plant Seedbank for the Prairies	Saskatoon, SK	Native Prairie Restoration and Reclamation Workshop	February 8, 2024
Western Canada Native Seed Producer Networks	Tartu, Estonia	Society for Ecological Restoration, European Conference	August 27, 2024
Western Canada Native Seed Producer Networks	Vancouver, BC	Society for Ecological Restoration, North American Conference	October 31, 2024
Seed Banking - European Perspectives	Saskatoon, SK	Meewasin Valley Authority, Seedbank Steering Committee	November 4, 2024
Native Seed Industry – European Perspectives	Virtual	Nature Conservancy of Canada, Manitoba Region Staff Meeting	November 12, 2024
The Fields Ahead: Finding Your Passion in Agriculture	Saskatoon, SK	University of Saskatchewan College of Agriculture and Bioresources Bean Feed Event	November 18, 2024
Growing Canada's Native Seed Industry Insights from a Nuffield Canada Scholar's European Journey	Virtual	Saskatchewan Prairie Conservation Action Plan Webinar Series	November 21, 2024
Native Seed Selection for Restoration	Saskatoon, SK	University of Saskatchewan's Restoration Ecology Class	February 2, 2025
Buildings a Native Plant Seedbank in Western Canada	Virtual	Alberta Grassland Restoration Forum Webinar Series	February 6, 2025
Native Seed Industry – European Perspectives	Regina, SK	Native Prairie Restoration and Reclamation Workshop	February 12, 2025
Habitat Restoration – European Perspectives	Regina, SK	Native Prairie Restoration and Reclamation Workshop	February 12, 2025
Growing Western Canada's Native Seed Industry	Tucson, Arizona	National Native Seed Conference	February 25, 2025
Native Seed Sourcing for Restoration	Virtual	Saskatchewan Institute of Agrologists, SW Branch Webinar Series	March 12, 2025
Native Seed Conservation and Seed Banking	Virtual	Meewasin Valley Authority's RBC Tech for Nature Webinar Series	March 27, 2025

Seeds of Change – Growing More Wildflowers in Saskatchewan	Saskatoon, SK	Gardenscapes Spring Gardening Showcase	March 29, 2025
Nurturing Seeds of Change	Saskatoon, SK	Saskatoon Nature Society's Monthly Meeting	April 17, 2025
Meewasin's Prairie Seed Banking Initiative	Virtual	Government of British Columbia, Conservation Science Webinar Series	June 19, 2025
Conserving Prairie Heritage: Building a Native Plant Seedbank Network for Western Canada	Denver, Colorado	Society for Ecological Restoration, World Conference	October 1, 2025
Growing Connections: Advancing Canada's Native Seed Industry Through Collaboration and Producer Networks	Denver, Colorado	Society for Ecological Restoration, World Conference	October 3, 2025
Growing the Future of Prairie Restoration: Building a Resilient Native Seed Industry in Western Canada	Virtual	Society for Ecological Restoration, Western Canada Chapter	November 5, 2025
Growing the Future of Prairie Restoration: Building a Resilient Native Seed Industry in Western Canada — Insights from a Nuffield Canada Study	Virtual	Canadian Wildlife Federation – Native Seed Webinar	January 12, 2026
Stewarding the Grasslands: Celebrating the International Year if Rangelands and Pastoralists	Saskatoon, SK	University of Saskatchewan - International Year of Rangelands and Pastoralists Event Series	January 14, 2026
Growing the Future of Prairie Restoration: Building a Resilient Native Seed Industry in Western Canada	Victoria, BC	Nuffield Canada Global Knowledge Exchange - Nuffield Canada AGM	January 23, 2026

APPENDIX C. Media Interviews On My Nuffield Canada Project (To December 2025)

Article	Media	Date	Link
Saskatoon-area man is on a quest in England and Ireland to restore biodiversity in native plant seeds	CBC Saskatoon Radio	July 29, 2024	https://www.cbc.ca/listen/live-radio/1-88-saskatoon-morning/clip/16084544-saskatoon-area-man-quest-england-ireland-restore-biodiversity-native
Renny Grilz, resource management officer at Meewasin Valley Authority, talks about his advocacy for a native seedbank to preserve prairie habitats	CBC Saskatchewan Radio	March 26, 2025	https://www.cbc.ca/listen/live-radio/1-103-the-306/clip/16136414-the-306-j.d.-vances-greenland-visit-saskatoons

APPENDIX D. Visitors to Blazing Star Wildflower Seed Company Farm Because of Nuffield Canada Project (To October 2025)

Visitor	Location	Date	Purpose of the Visit
Paul Flanagan, Arvum Group (Meadowmania (Ireland) and Connecting to Nature (UK)	Ballymountain, Ireland	September 2024	- Learn about native seed production programs and seed cleaning - Learn about key findings from visits with native seed producers in Europe
Claudia Benn, 2024 Nuffield Australia Contemporary Scholar	Beilba, Queensland, Australia	June 2025	- As part of Nuffield Australia travels in Canada - Learn about native seed production programs, wildlife enhancement projects and native prairie restoration projects at the farm
Darin Sherritt, Environmental Scientist, Tannas Conservation Services	Killam, AB	June 2025	- Learn about Blazing Star's seed production system and on-farm wildlife enhancement projects.
David Smith, Environmental Technology Instructor with Keyano College	Fort McMurray, AB	August 2025	- Learn about native seed production programs, wildlife enhancement projects and native prairie restoration projects at the farm
Katherine Stewart, Restoration Ecology Professor, University of Saskatchewan	Saskatoon, SK	September 2025	- Learn about native seed production programs, wildlife enhancement projects and native prairie restoration projects at the farm with a class of 4th year students in a Restoration Ecology class
Gwen Peters, Grade 2 Teacher with Aberdeen Composite School	Aberdeen, SK	October 2024 September 2025	- A native tree, shrub and wildflower planting event with One School One Farm Shelterbelt project to bring children working with land landowners to create wildlife habitat and biodiversity; Grade 2 class is approximately 25 students per year.
Elizabeth Bekolay, Executive Director and Joanne Blythe, Board Member, with One School One Farm Shelterbelt Program	Saskatoon, SK	October 2024 September 2025	- A native tree, shrub and wildflower planting event with One School One Farm Shelterbelt project to bring children working with land landowners to create wildlife habitat and biodiversity; Grade 2 class is approximately 25 students per year.

APPENDIX E: Key Building Blocks for a Native Seed Industry in Western Canada

Focus Area	Strategic Actions	Intended Outcomes
National & Regional Producer Networks	• Formally constitute the Native Seed Producers of Canada (NSPC) as a national coordinating and advocacy body. • Expand and resource regional producer hubs across prairie ecozones (e.g., Manitoba–Saskatchewan, Southern Alberta). • Develop mentorship pathways, shared equipment pools, and Indigenous producer recruitment and leadership pathways**.**	• Coordinated national voice for producers. • Strong regional capacity aligned with ecological zones. • Reduced barriers to entry and improved producer retention.
Reducing Barriers to Production & Growth	• Invest in foundation seed development, seed increase programs, and applied agronomic research. • Fund shared infrastructure for cleaning, testing, storage, and mechanization • Provide start-up and scale-up support for new, small, and Indigenous-led enterprises.	• Expanded and professionalized producer base. • Increased species availability and production volumes. • Improved economic viability of native seed operations.
Standards, Certification & Provenance	• Establish prairie seed transfer zones, informed by forestry precedents and U.S. provisional zones • Develop provenance-based certification modeled on Germany's RegioZert® system. • Integrate standards into public procurement and restoration guidelines.	• Buyer confidence and ecological integrity. • Reduced risk of maladaptation and genetic erosion. • Consistent quality across restoration projects.
Stable Market Demand & Procurement	• Implement "Buy Canada First" procurement policies for public restoration projects. • Embed native seed requirements into biodiversity, climate adaptation, infrastructure, and wildfire recovery programs. • Encourage long-term (5–10 year) procurement contracts to stabilize demand.	• Predictable demand cycles enabling investment and planning. • Reduced reliance on imported or non-local seed. • Strong alignment between policy goals and seed supply.
Market Diversification & Innovation	• Expand markets beyond restoration into pollinator habitat, regenerative agriculture, municipal greening, green infrastructure, and Indigenous-led stewardship**.** • Support branding, certification, and market development for native horticulture and seed products.	• Greater industry resilience through diversified revenue streams. • Increased public and private demand for native plants. • Broader societal integration of native biodiversity.
Collaboration, Governance & Investment	• Establish a national cross-sector working group or council linking producers, Indigenous Nations, governments, NGOs, and researchers. • Pilot public–private investment tools (cost-share programs, habitat banking, producer grants). • Modernize policy to recognize native seed as a distinct category under the Canada Seeds Act, with clear labeling and Indigenous rights protections.	• Reduced financial and regulatory risk. • Clear governance and accountability. • Strong alignment across conservation, agriculture, and reconciliation objectives.

APPENDIX F: Key Building Blocks for Seedbanking in Western Canada

Focus Area	Recommendations	Intended Outcomes
Core Infrastructure	• Secure long-term funding for climate-controlled storage, processing, testing, and viability monitoring facilities. • Invest in equipment and staff capacity to support wild collection, seed cleaning, and long-term storage.	Reliable, secure conservation storage for hundreds of prairie and parkland species, safeguarding genetic diversity over time.
Inclusive Governance and Indigenous Leadership	• Co-design seedbank governance with Indigenous Nations, governments, producers, NGOs, and research institutions. • Embed Indigenous data sovereignty, cultural protocols, and consent-based access to collections.	Transparent, culturally respectful seedbank governance with strong sector trust and Indigenous leadership.
Linking Seedbanks to Production and Restoration	• Use seedbank collections to supply provenance-tracked foundation seed for rare, underrepresented, and high-priority species. • Reduce pressure on wild populations by directing collected material into managed grow-out and commercial production.	Expanded species diversity in the commercial market and more reliable seed supply for large-scale restoration.
Standards, Best Practices, and Networks	• Adopt internationally recognized protocols (e.g., GRIN, Millennium Seed Bank standards) for collection, storage, and documentation. • Integrate seedbank data into Canadian and global conservation databases. • Serve as a coordinating hub for decentralized community, Indigenous, academic, and regional seedbanks.	Maximum genetic security, improved research access, and alignment with national and international conservation efforts.
Strategic Role in a National System	• Position prairie seedbanks (e.g., Meewasin) as regional hubs within a future National Native Seedbank Network. • Align seedbank priorities with GBF targets, Canada's 2030 Nature Strategy, and regional restoration needs.	A coordinated, resilient seedbank system that underpins biodiversity recovery, climate adaptation, and long-term restoration capacity.

APPENDIX G. Building Pathways for a Resilient Native Seed Industry in Western Canada

Focus Area	Details / Context	Key Insight	Priority Actions	Priority Outcomes
Native Seed Production & Producer Support	International models (Germany's Regiosaatgut; U.S. National Native Seed Strategy) demonstrate that producers succeed when supported by stable demand, foundation seed programs, and shared infrastructure. In Canada, production remains fragmented, under-capitalized, and constrained by inconsistent demand and high costs.	Producers must be placed at the center of the system, supported by predictable markets, training, and infrastructure.	Establish regional producer hubs with shared cleaning, testing, and storage infrastructure; create a Canadian Foundation Seed Program; offer long-term (5–10 year) procurement contracts; deliver national producer training and mentorship programs.	Operational producer hubs supporting multiple growers; foundation seed available for priority species; stable procurement contracts in place; expanded and professionalized producer base.
Seedbanks & Long-Term Genetic Conservation	International seedbanks (Millennium Seed Bank; USDA Genebanks) demonstrate how conservation and restoration supply can be integrated. Canada lacks a prairie-focused seedbank, leaving grassland species underrepresented and restoration vulnerable.	Seedbanks are both genetic insurance and essential supply-chain infrastructure.	Establish the Meewasin Seedbank as a prairie pilot; align protocols with GBF and international standards; integrate Indigenous-led collections; link seedbank outputs directly to foundation seed and commercial production.	Prairie-focused seedbank operational; priority species secured; Indigenous governance embedded; reduced pressure on wild populations; increased species diversity in the commercial market.
Policy, Governance & Procurement	In Europe and the U.S., legislation and procurement standards drive market stability and ecological appropriateness. Canada lacks binding policies, seed zones, and certification frameworks for prairie species.	Policy and procurement are the strongest levers for market stability and scale.	Implement a National Native Seed Strategy with binding targets; establish prairie seed transfer zones and provenance-based certification; require Canadian-grown native seed in public projects; introduce tax incentives or stewardship credits.	National strategy implemented; seed zones and certification adopted; Canadian-grown seed prioritized in procurement; increased buyer confidence and ecological outcomes.

Emerging Markets & New Uses	Native plants support applications beyond restoration: pollinator habitat, regenerative agriculture, urban greening, Indigenous food and medicine, and green infrastructure. European and U.S. models show diversification strengthens markets.	Market diversification increases resilience and embeds native plants in everyday landscapes.	Partner with municipalities to develop native landscaping standards; expand pollinator programs in agriculture; support Indigenous-led market development; create branding and certification for native seed and plant products.	Expanded demand beyond restoration; municipal and agricultural uptake increased; Indigenous-led enterprises supported; national recognition of Canadian native seed products.
Collaboration & National Coordination	Strong producer networks (ENSPA; Seeds of Success) enable coordination, advocacy, and quality control. Canada's networks are emerging but lack sustained funding and formal governance.	National coordination and strong producer networks are essential to scale supply and align demand.	Formalize and resource the Native Seed Producers of Canada; establish a Canadian Native Seed Council; develop a producer registry and capacity database; host annual national conferences and exchanges; secure long-term coordination funding.	Integrated national network operating; producer registry and forecasting tools in place; sustained collaboration across regions; coordinated growth of Canada's native seed industry.

APPENDIX H. PATHWAYS TO DEVELOPING A PRAIRIE NATIVE SEEDBANK NETWORK

FOCUS AREA	DETAILS	KEY INSIGHTS	RECOMMENDATIONS	PRIORITY OUTCOMES
Seedbank Infrastructure	International models (Millennium Seed Bank, USDA NLGRP) show that purpose-built, climate-controlled facilities are essential for long-term genetic conservation and restoration supply. Canada lacks prairie-focused infrastructure.	Seedbanks are foundational infrastructure, not optional conservation add-ons.	Secure funding for a prairie-focused seedbank facility with climate-controlled storage, processing, testing, and long-term viability monitoring.	Prairie seedbank facility established and operational; long-term storage secured for priority grassland and parkland species.
Inclusive Governance and Indigenous Leadership	Leading seedbanks integrate governments, Indigenous Nations, producers, and researchers in governance and decision-making. Canada is beginning this work through NTSC ISCP and regional initiatives.	Seedbanks must be co-governed to be culturally appropriate, trusted, and durable.	Co-design governance frameworks with Indigenous Nations, producers, NGOs, and governments; embed Indigenous data sovereignty and cultural protocols.	Transparent governance structure in place; Indigenous leadership embedded in policy, collections, and access decisions.
Linking Conservation to Production	Successful systems link wild collections directly to foundation seed and commercial grow-out, reducing pressure on wild populations. Canada lacks formal pathways between seedbanks and producers.	Seedbanks must actively support production, not operate in isolation.	Use seedbank collections to supply foundation seed for rare and underrepresented species; establish clear pathways from collection to grow-out.	Increased species diversity available to producers; reduced reliance on wild harvest for restoration projects.
Standards, Protocols, and Data Systems	International best practices rely on standardized collection, storage, and documentation protocols (e.g., GRIN, Millennium Seed Bank standards).	Consistent protocols ensure genetic integrity, traceability, and long-term value.	Adopt GRIN-compatible databases and Millennium Seed Bank protocols; standardize documentation across collections.	High-quality, traceable collections integrated into national and global databases.
Networked Seedbank System	Decentralized systems function best when linked through a coordinating hub. Canada has multiple unconnected initiatives across regions.	A networked system increases resilience and coverage across ecosystems.	Position regional seedbanks (e.g., Meewasin) as hubs within a National Native Seedbank Network linking community, Indigenous, research, and national facilities.	Coordinated national seedbank network established; improved access for restoration, research, and climate adaptation.

Alignment with Policy and Restoration Targets	Seedbanks in Europe and the U.S. are embedded in biodiversity legislation and restoration programs. Canada's seedbanks are not yet aligned with GBF or procurement frameworks.	Seedbanks gain relevance and funding stability when embedded in policy.	Align seedbank priorities with GBF Targets, Canada's 2030 Nature Strategy, and public procurement needs.	Seedbank outputs directly supporting national restoration and biodiversity commitments.

APPENDIX I: Key Insights from the Nuffield Canada Study

This study identifies a set of core insights that define both the challenges and opportunities for building a resilient, coordinated native seed system in Prairie Canada. These insights are drawn from international case studies, Canadian market assessments, policy analysis, and field-based research across Europe, the United States, and Canada.

1. Native seed producers are the foundation of ecological restoration
Native seed producers, including farmers, Indigenous enterprises, conservation organizations, and small businesses, are the backbone of every restoration project. Without a strong, well-supported producer base, Canada cannot meet rising demand for native seed associated with habitat restoration, species-at-risk recovery, pollinator programs, regenerative agriculture, or climate adaptation. Producers supply not only seed, but also ecological knowledge, regional genetic resources, and stewardship capacity essential for long-term restoration success.

2. International models show that coordination and policy create functioning markets
Experiences from Germany (Regiosaatgut), the United States (National Native Seed Strategy), and the United Kingdom (Biodiversity Net Gain) demonstrate that successful native seed systems are built on coordinated policy frameworks. Provenance-based standards, long-term procurement mechanisms, integrated seedbanking, and sustained investment in infrastructure are essential to creating stable demand and professionalized production. These systems do not emerge organically; they are enabled by deliberate public policy and long-term planning.

3. Canada's native seed system remains fragmented and underdeveloped
Despite growing restoration commitments, Canada's native seed sector, particularly in Western Canada, remains small, fragmented, and under-supported. Fewer than 50 dedicated native seed producers operate across the Prairie provinces, most at part-time or small-to-medium scale. Persistent challenges include inconsistent demand, limited access to foundation seed, underinvestment in processing and mechanization, and the absence of standardized provenance or quality systems. Canada currently lacks a national native seed strategy, prairie-focused seed transfer zones, and a coordinated grassland seedbank network.

4. Emerging markets represent significant untapped opportunity
Beyond ecological restoration, native plants are increasingly important in green infrastructure, regenerative agriculture, pollinator and wildlife habitat programs, Indigenous-led stewardship, climate-resilient landscaping, carbon sequestration, and nature-based solutions. These emerging applications represent a major opportunity to diversify markets, stabilize demand, and support rural and Indigenous economic development if supply chains and policy frameworks are aligned to support them.

5. Collaboration, governance, and social networks are as important as infrastructure
Resilient seed systems depend not only on physical infrastructure, but also on strong social and institutional networks. Effective collaboration among producers, Indigenous Nations, governments, NGOs, researchers, and restoration practitioners is essential. Shared infrastructure, inclusive governance, transparent standards, and integrated seedbank–producer partnerships are critical to scaling supply while maintaining ecological integrity and cultural respect.

APPENDIX J: Call to Action: Building Western Canada's Native Seed System

Canada stands at a critical moment. Restoration ambitions under the Kunming–Montreal Global Biodiversity Framework, the Bonn Challenge, and Canada's 2030 Nature Strategy cannot be achieved without a coordinated, well-supported native seed system. Closing the gap between restoration goals and seed supply requires immediate, deliberate action.

1. Establish prairie-focused seedbank infrastructure

Develop a Western Canadian native plant seedbank network to conserve genetic diversity, support foundation seed production, reduce pressure on wild populations, and stabilize seed supply for large-scale restoration. Regional hubs, such as the proposed Meewasin Seedbank, should complement national facilities and Indigenous-led initiatives.

2. Implement a Canadian National Native Seed Strategy

Advance a coordinated Canadian National Native Seed Strategy with regional implementation, prairie-specific seed transfer zones, provenance-based certification, and clear quality standards. The strategy should align directly with Canada's biodiversity, climate, and restoration commitments, and be grounded in producer and Indigenous leadership.

3. Invest in native seed producers as essential restoration infrastructure

Support producers through long-term procurement policies, mentorship and training programs, shared processing and storage infrastructure, and access to foundation seed. Procurement frameworks should prioritize Canadian-grown, provenance-based native seed in publicly funded restoration, infrastructure, and climate adaptation projects.

4. Embed native seed into nature-based solutions policy

Recognize native seed as a cornerstone of nature-based solutions across federal and provincial policy frameworks. Native seed use should be embedded in biodiversity recovery programs, climate adaptation funding, agricultural sustainability initiatives, and land stewardship incentives.

5. Strengthen collaboration and Indigenous-led partnerships

Build durable cross-sector collaboration by resourcing producer associations (such as the Native Seed Producers of Canada), supporting regional seed hubs, and advancing Indigenous-led seed conservation and production initiatives. These partnerships are essential to reconciliation, cultural revitalization, and long-term stewardship of prairie ecosystems.

APPENDIX K: Policy Brief

Growing the Foundations of Restoration: Building a Resilient Native Seed Industry for Western Canada

Author: Renny W. Grilz, PAg | 2024 Nuffield Canada Scholar
Focus: Native seed systems, seedbanks, and producer networks in Western Canada

Executive Summary

Canada has committed to ambitious biodiversity, climate, and restoration targets under the Kunming–Montreal Global Biodiversity Framework (GBF), the Bonn Challenge, and Canada's 2030 Nature Strategy. Achieving these commitments depends on one foundational input: the availability of ecologically appropriate, regionally adapted native seed.

This policy brief synthesizes findings from a multi-year Nuffield Canada research program spanning Europe, the United States, and Canada. It demonstrates that without a coordinated, producer-centered native seed industry, Canada's restoration goals will remain out of reach. International experience shows that successful seed systems are built on five pillars: strong producer networks, seedbanks integrated with production, binding procurement policy, market diversification, and national coordination.

Western Canada possesses the ecological need, producer expertise, and emerging networks required to build such a system. What is missing is coordinated policy, investment, and infrastructure. This brief outlines the challenge, highlights international lessons, and presents priority actions to establish a resilient, Canadian-grown native seed supply chain.

The Challenge

Prairie grasslands are among the most threatened ecosystems in North America, with less than 20% remaining intact. Large-scale restoration is now a national priority, yet Canada's native seed supply remains fragmented, underdeveloped, and under-recognized.

Key constraints include:

- Fewer than 50 dedicated native seed producers in Western Canada, many operating at small or part-time scale.
- No national native seed strategy and no prairie-specific seed transfer zones.
- Limited access to foundation seed, cleaning, storage, and processing infrastructure.
- Heavy reliance on short-term project funding rather than stable procurement.
- Absence of a prairie-focused seedbank to safeguard genetic diversity and support supply.

This gap between restoration ambition and seed supply represents one of the most significant bottlenecks in meeting Canada's biodiversity and climate commitments.

International Evidence: What Works

International models provide clear guidance:

Europe

- Germany's *Regiosaatgut* system legally mandates provenance-based native seed in public projects.
- Producer associations (e.g., VWW, ENSPA) set quality standards, coordinate supply, and advocate policy.
- Restoration policy creates stable, long-term markets that support rural economies.

United States

- The National Native Seed Strategy integrates seed supply into wildfire recovery, climate adaptation, and biodiversity policy.
- Programs such as Seeds of Success and the National Plant Germplasm System link wild collection, seedbanks, research, and commercial production.
- Regional partnerships (e.g., Northeast Seed Network) demonstrate the importance of collaboration and shared infrastructure.

Across all contexts, success depends on policy-driven demand, coordinated producer networks, seedbank integration, and long-term investment.

Opportunities for Western Canada

Canada already has strong foundations:

- Skilled producers and Indigenous seed stewards.
- Emerging networks such as the Native Seed Producers of Canada.
- Regional strategies in Manitoba, Southern Alberta, and Southern Ontario.
- National seedbank capacity in crops and forestry that can inform regional grassland seedbanking systems.

With coordinated action, Western Canada can:

- Reduce reliance on imported or ecologically inappropriate seed.
- Strengthen rural and Indigenous economies.
- Improve restoration success and climate resilience.
- Align agricultural diversification with biodiversity outcomes.

Priority Policy Actions

1. Establish a National Native Seed Strategy

- Led federally, with provincial and regional implementation.
- Include prairie seed transfer zones, provenance standards, and quality certification.
- Align explicitly with GBF Targets, the Bonn Challenge, and Canada's 2030 Nature Strategy.

2. Invest in Producers and Infrastructure

- Support regional producer hubs with shared cleaning, storage, and testing facilities.
- Establish a Canadian foundation seed program for priority prairie species.

- Enable long-term (5–10 year) procurement contracts to stabilize markets.

3. Build a Prairie-Focused Seedbank Network

- Establish a prairie seedbank hub (e.g., Meewasin) linked to national facilities.
- Integrate Indigenous-led collections and governance.
- Use seedbanks as active partners in foundation seed supply, not passive storage.

4. Embed Native Seed in Procurement and Policy

- Require Canadian-grown, provenance-appropriate seed in publicly funded projects.
- Recognize native seed as a distinct category under the Seeds Act.
- Create incentives for private landholders, municipalities, and industry.

5. Strengthen Coordination and Governance

- Resource the Native Seed Producers of Canada as a national coordinating body.
- Support regional collaboratives and knowledge-exchange networks.
- Invest in training, mentorship, and applied research.

Conclusion

Native seed producers are the backbone of ecological restoration. Without them, restoration targets become aspirations rather than outcomes. International experience shows that when policy, producers, and science are aligned, native seed systems deliver biodiversity recovery, climate resilience, and rural economic benefits.

Canada stands at a turning point. By investing now in a coordinated, producer-driven native seed industry, Western Canada can transform restoration ambition into lasting ecological and economic legacy. The seeds required for that future already exist; what is needed is the policy framework to allow them to grow.


Native
Seed
Restoration
Canada
Species
Nuffield
Canada
Production
Seedbank
Ecological
National
Infrastructure
Prairie
Producers
Plant
Policy
Development
Habitat
Western
Wildflower
August
Standards
Pollinator
Coordinated
Wild
Society
Including
Industry
Projects
Plants
Programs
Climate
Supply
Biodiversity
Networks
Seeds
Framework
Foundation
Conservation
Producer
Seedbanks
Nature
Indigenous
Agriculture
Support
Systems
System
Long-Term
Strategy
Across
Demand
Global
Storage
Scale
Zones
Botanical
Nuffield
Management
Germany
Farm
Canadian
Diversity
Genetic
International
Research
Program
Project
Market
Procurement
July
Cleaning
Provenance
Transfer
Resources
Coordination
Outcomes
Provenance-Based
Partnership
Shared
Governance
Discussed
Ecosystems
Grazing
Meewasin
Collection
Rural
Saskatoon
Experience
Collections
Several
Opportunities
Commitments
Limited
Investment
Estonia
Tartu
Growers
Grasslands
University
Visited
Wildflowers
Facility
Create
Challenge
Success
Stewardship
Initiatives
Models
Southern
Essential
Met
Economic
February
Arizona
Without
Agricultural
Needs
Partnerships
Landscapes
Processes
Seed-Based
Working
Commercial
Efforts
Resilience
June
Must
Fire
Part
Emerging
Numerous
Leadership
Tree
Use
Regional
England
Adaptation
Regarding
Wildlife
Recovery
Toured
European
Federal
Capacity
Frameworks
Growing
Urban
Establish
Markets
Public
Key
Natural
Local
Targets
Remains
Vww
Gardens
Training
Green
Resilient
Garden
One
Tour
Near
Park
October
Land
Priority
Area
Small
Stable
Nursery
Strong
Signage
Fragmented
Discussions
Demonstrate
Landscaping
Site
Interpretive
Indigenous-Led
Quality
Network
Action
Access
Align
Certification
Collaboration
Conference
Ireland
Ecosystem
Sector
Building
Within
Significant
Facilities
Greenhouse
Integrated