

NATIVE SEED HARVESTING and MARKETING

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THE NATIVE PLANT SOCIETY OF SASKATCHEWAN INC.

The NPSS is a non-profit organization formed in 1995. Our membership includes representation from government, industry, farming, ranching, conservation groups, research organizations, and nature enthusiasts. The NPSS is proud to be a partner in the Prairie Conservation Action Plan.

The NPSS also supports individuals and organizations producing and marketing native seed. Native seed is required to ensure conservation and increased distribution of native plants and their habitats and to promote appreciation of native plants.

The NPSS supports the native seed industry through its Native Plant Listing Service. With this Listing Service producers, suppliers, and service providers in the native seed industry are listed on the internet and in a catalogue. This service is currently provided at no charge to NPSS members.



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Photos in text by author unless otherwise indicated.*

**Native Plant Society
of Saskatchewan Inc.**



Written by: Andy Hammermeister
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INTRODUCTION

Native plants offer a wide range of benefits to everyone in society. Uses for native plants range from forage for livestock and habitat for wildlife to wildflower gardening and nutraceuticals. These and other uses have generated an interest in collecting and/or growing native plants and seed for personal uses and as an additional source of revenue. While improper collection practices may damage native ecosystems, appropriate seed harvesting can be a rewarding and interesting experience. Native seed harvesting requires an intimate knowledge of plants, the land where they grow, and harvesting techniques. Collecting as a source of revenue requires a further understanding of native seed markets.

The purpose of this publication is to introduce the reader to basic principles and practices in sustainable native seed harvesting and marketing.

WHAT IS A NATIVE PLANT?

'Native plants' are generally described as "plants occurring naturally in an area prior to Eurasian settlement". This means that plants native to southwestern Saskatchewan may not be native in other parts of the province, country, continent, or world. Plants brought by humans to an area where they previously did not exist are referred to as "introduced, exotic, or non-native" species.

There are three 'types' of native seed that are currently being marketed or developed. Wild-type seed is harvested from plants in the wild. As a result, this seed is generally regarded to have high genetic diversity and may be especially well adapted to the specific region where it is found. Wild-type seed may also be collected and grown in a cultivated setting for seed production. Wild-type seed may not perform as well as other types of the same species where specific traits have been selected for.

Cultivars are plants that have been selected or bred by humans to express certain characteristics such as high germination and productivity. While

cultivars are considered to be varieties of native species, they have lower genetic diversity than wild-type seed as a result of the breeding or selection program.

Seed for ecological varieties of a species are collected from sources throughout a certain region or soil type and propagated through nursery production. Some selection does take place, however, emphasis is placed on maintaining high genetic diversity. *Ecovars™*, trademarked by Ducks Unlimited, are a variety series (product line) being developed through Native Plant Solutions Ltd. with the cooperation of various government agencies and private organizations. *Ecovars™* are similar to (sometimes considered synonymous with) ecological varieties in that emphasis is placed on retaining as much genetic diversity as possible. However, *Ecovars™* are selected for high seed production and seed vitality.

SUSTAINABLE SEED COLLECTION

Native ecosystems can never be replaced. Conservation of remaining plant communities must be considered an important priority because of the many economic, spiritual, medicinal, and sociological values that are associated with them. The genetic diversity of these well adapted ecosystems is also of key importance. All native plant species in any given area should be considered of value to that area. The following guidelines outline general practices for minimizing impact of native seed collection.

Know Your Species

- Know the flora of the area, avoid locally uncommon, rare, or endangered species.
- Identify plants before collecting seeds or cuttings.

- Collect from large local populations, both to maximize genetic diversity of your collection and to minimize effects on the natural population.

Collecting Seeds

- Collect when sites are least susceptible to damage by your collecting. Collect seeds or cuttings, not entire plants.



Mark target plants before harvesting. Photo credit: Dean Nernberg

- Flag or label plants while in bloom or be able to identify plants in seed stage.
- Collect ripe seeds (firm, and dry). Seeds are usually ripe 6 to 8 weeks after flowering. Usually the stem will be brown and dry. Label seeds when you collect them.
- Seeds can be collected from May to November as flowering and seed production varies considerably among species.
- Make sure seeds are dry before storing; store in a cool, dry place. Heat and moisture will deteriorate the seeds.
- Remember you are not the only person collecting seed so use your discretion and leave enough seed to

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Report occurrences of rare species to: the University of Saskatchewan Fraser Herbarium (966-4968); or the Saskatchewan Conservation Data Centre (787-7085). Information about rare plants in your area can also be obtained from these sources.

allow propagation, and provide food and habitat for insects, birds, and mammals. Note: native seed production is generally low and infrequent.

- Do not intensively collect from the same area year after year. Keep records of collection date, location, and species present.
- To promote genetic diversity, collect seeds at several times during the season and over several years. Use multiple locations within the ecoregion for collection.

Where to Collect

- It is illegal to collect from national, provincial, and municipal parks and protected natural areas.
- Obtain necessary permits to collect on forestry reserves and community pastures.
- Obtain permission from landowners or lease holders to collect on private lands.
- Avoid busy highways and roads. Roadside collection is dangerous and may encourage indiscriminate collection by others.
- Avoid rare or fragile habitats such as sand dunes or wetlands.

WHAT DO BUYERS WANT IN NATIVE SEED? ...KNOWING YOUR MARKET

Harvesting native seed as a source of revenue can be a waste of time and resources if it is not well planned. As with any business, you need to know the requirements and standard of your target market. Markets, discussed in greater detail in a later section, may range from wildflower gardeners and landscaping companies to the reclamation industry and conservation



Different plant species grow in different parts of the landscape. Be sure to scout your pasture for target species and potential weed problems.

Here is what buyers are looking for:

- Source identification – who the supplier is and where the seed was collected;
- Free of exotic species and weeds;
- Clean (de-awned / debearded, minimal trash);
- High viability and germination;
- Single species as opposed to mixes (not always);
- Price – lower is better but they will pay more for quality.

agencies. The species and volumes of seed demanded vary considerably but you can be sure that all markets want high quality. A reputation for supplying high quality seed will spread as quickly as a reputation for poor quality. So what do buyers want?

HARVESTING NATIVE SEED

Failing to plan your native plant harvesting will only lead to disappointment. Disappointment can be avoided, however, by knowing your landscape, plants, harvesting techniques, and seed handling practices.

Location, location, location...

Numerous options for collecting exist including your own land, a neighbour's land, and Crown land. Here are a few points to consider.

- Avoid land infested with exotic and weedy species. Buyers will not take native seed infested by exotic grasses and weeds because of the cost of managing/removing them.

- Obtain permission and permits (on Crown land) well in advance. Some landowners may want to negotiate cash for access or a share of the seed or revenues.
- Consider the terrain and the capabilities of your equipment.
- Look for desirable/targeted species; mark their location; note if they are patchy or widespread, and if they are collectible. Shrubby areas are difficult to harvest.
- Take note of the range condition and grazing plans of the land owner. Is the land overgrazed or undergrazed?
- Staying close to home reduces costs and is easier for monitoring plant development.

Know your plants

Knowing your plants will help you decide what, when, and how to harvest, or even if it is worthwhile harvesting. It



Fringed brome. Photo credit Dean Nernberg

is important to know how to identify your target plants as well as others, especially undesirables to avoid them. Plant identification is a skill that only comes with practice. You will need to know what the plant looks like in its vegetative and flowering stages to help with scouting and planning, and in the seed stage for harvesting.



Dotted blazing star.

Equally important is knowing the natural history of your target plant. This includes knowing how often the plant sets seed, how factors like weather, grazing, and fire affect seed production, and the timing of flowering and seed ripening. While some species have a long harvest window, others are very susceptible to shattering, and still others do not ripen uniformly. Some species will produce seed only once every few years while others will produce whenever conditions are suitable.

Seed harvesting

Successful native seed harvesting requires special attention to details that may not be considered in normal crop production.

- Timing is critical – daily monitoring of some species is necessary to catch the seed when it is ripe but hasn't shattered.



*Hand collecting wildflower seed.
Photo credit Dean Nernberg*



Four foot seed stripper. Photo credit Dean Nernberg



Collecting wildflower seed using a handheld vacuum. Photo credit Dean Nernberg

- Quality is more important than quantity, avoid ditches, utility corridors, and tame pastures/hay where exotics and weeds may be present.
- Label seed on site (location, lot #, date, species).
- Heat and moisture kill seed; dry seed immediately in a cool dry place.

- Keep seed separated into 'lots', separate parts of a pasture, different pastures, and parts of the landscape.

A wide variety of harvesting equipment and techniques are now available. Each of these has its advantages and disadvantages in terms of cost, volume of collection, selectivity, and accessibility/ maneuverability (Table 1). Hand picking and hand

held equipment is low cost, highly maneuverable, and highly selective. Large harvesting equipment is good for collecting high volumes but is generally less maneuverable and more costly. Swathing or direct combining seed from pastures (i.e. versus nurseries) is not recommended because it is non-selective and results in harvest of non-target and unripened seed. Factors influencing your equipment selection will include: plant height, seed size and weight, patchiness, and terrain.

Seed supply from wild harvesting can be unreliable due to variables such as climate, management practices, and poor timing of harvest. Furthermore, seed production may not be near its potential due to competition for nutrients, water, light, and space. Patchy distribution of plants may also make species-specific harvesting very slow; a large land base may need to be covered. The advantages of wild harvesting, however, lie in its low maintenance; if cattle are excluded and the weather is right the plants will grow on their own.

Quick fact: 1000 kg of bulk spear grass seed = approximately 175 to 225 kg Pure Live Seed

TABLE 1. CHOOSING YOUR EQUIPMENT.

Method	Cost	Volume	Selectivity	Accessibility
Hand Collecting	Low	Low	High	High
Hand Vacuum	Low	Low	High	High
Hand Stripper	Low-Medium	Low-Medium	High	High
4 ft Stripper	Medium	Medium-High	Medium	Medium
12 ft Flail-vac	High	High	Medium-Low	Low

NURSERY PRODUCTION

By growing native plants in monocultures (in separate plots like crops), nursery production minimizes problems associated with wild harvesting of seed. Nurseries may produce four times the amount of seed collected in a similar area of rangeland through weeding, fertilization, irrigation, and/or other specialized management practices. The seed is also easier to clean because weeds are controlled and other species are excluded. Furthermore, the seed supply is typically more reliable as environmental variables are controlled.



*Combine on June grass plots.
Photo credit Nora Stewart*



Nursery plots.



*Nursery plots need a lot of weeding!
Photo credit Dean Nernberg*

The disadvantages of nursery production lie in the time and expense involved in plot maintenance (weeds, weeds, weeds!!!) and limited agronomic information available for many plants.

SEED PROCESSING AND ANALYSIS

Once the seed is harvested it needs to be processed. The type of processing will vary

from species to species but may include threshing, debearding (various grasses), and cleaning. The weight and form of seed varies widely from species to species and therefore specialized cleaning equipment and experienced operators are required. Because of this many seed cleaning companies may not be able to clean native seed. Custom native seed processing ranges in cost up to five dollars per bulk kilogram (prices vary). Once the seed is cleaned it should be stored in a cool dry location.

Most native seed clients will want to see a seed certificate indicating the quality of the seed stock. Some seed labs have specially trained staff for testing native seed. Seed testing may include percent: pure live seed, germination/dormancy rates, and viable vs. dead seed. Seed tests may also include lists and quantities of weeds (noxious and common), other native species, and other crop seeds. Seed samples typically range from 25 g to 50 g in size. Prices vary depending on what you order but can range from \$25 to over \$150. Cleanliness and composition (what species are there) of seed generally only needs to be tested once. However, seed germination and viability may change with time and clients may request current information.



*Sorting needle and thread grass before debearding.
Photo credit Dean Nernberg*

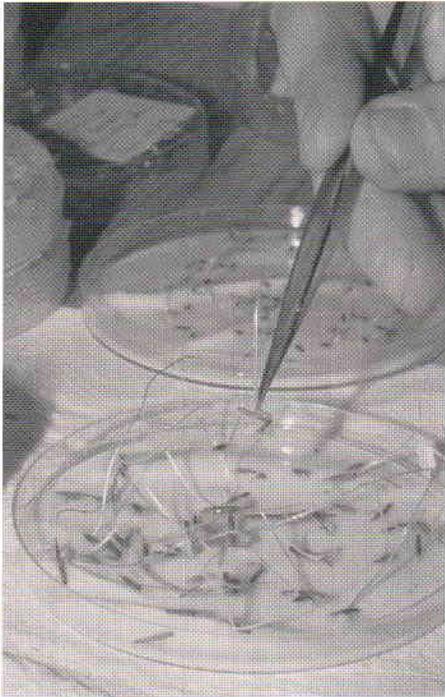


*Debearding needle and thread grass.
Photo credit Dean Nernberg*

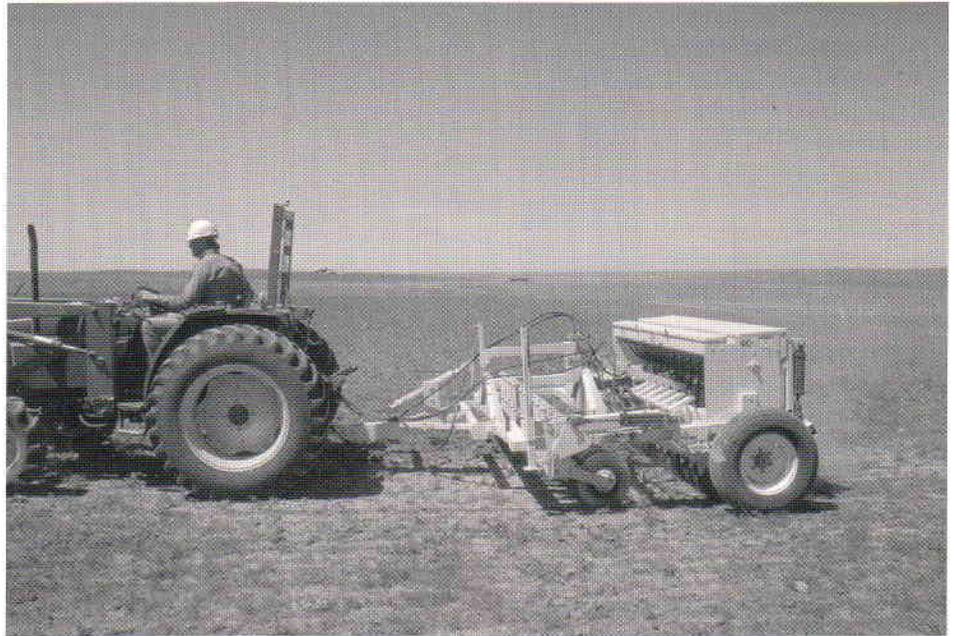


*Threshing forb seed heads.
Photo credit Dean Nernberg*

Explain what information you would like from your seed test. The same terms (eg. purity) may mean different analyses at different seed testing labs. Educate yourself on what testing can be done and what should be done. In wild harvest mixes, for example, you may want to know the percent of secondary species and not just the number of seeds/sample size if these species are commercially valuable and common in the seed lot.



Germination tests are commonly requested by buyers. Photo credit Dean Nernberg



The reclamation industry is an important market for native seed.

MARKETING NATIVE SEED

Seed Markets

Specific seed markets vary by species and change with time. Grass seed is typically demanded in larger volumes while flower seed is usually demanded in small amounts.

The reclamation sector is one of the largest markets for native seed. On the prairies government regulations and guidelines specify that native plant habitats disturbed by industrial development must be revegetated with similar native species as part of reclamation. Industries in the reclamation market may include: petroleum, mining, forestry, utility transmission (gas, power, and phone companies), highway and road construction, gravel, and tourism.

Conservation organizations and programs are another important native seed market. Agencies (non-government or government) holding

large pieces of land for conservation often need native seed to restore disturbed habitat or develop habitat for wildlife. Government promoted cropland conversion programs also encourage the use of native seed.

Other markets for native seed include the horticultural, landscaping, and nutraceutical industries. These specialized markets typically require smaller volumes of high quality, seed.

The native seed industry has considerable potential but has been limited by inconsistent supply, high price, production challenges, and scarce marketing. Many markets have been left untapped and need a concerted effort to develop. Supplies of native seed are expected to grow as Ecovars™ become available and native seed nurseries come on-line. This will probably result in a decline in price, however, demand should increase as a result of increased marketing and as seed supply becomes less variable.

Approaches to selling seed

Targeting and knowing a market is critical in the native seed business. Clients may range from gardeners looking for a few grams of wildflower seed to reclamation companies looking for tonnes of grass seed. Different approaches will be need to satisfying



Forb seed can vary considerably in size and shape. Clockwise from top: gaillardia (blanket flower), blue-eyed grass, ground plum, Indian bread root, dotted blazing star.

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each market. Ideally you should identify a target market before you start planning your native seed harvest. Contact potential buyers and find out what species they are looking for, how much, when they need it, and what they are willing to pay.

Because native seed markets are so specialized, you may consider finding a seed broker to market your seed or a wholesaler to buy it from you (Figure 1). Otherwise, you could go to the open market where you will need to establish a clientele either through direct contact or advertising. Seed marketing should

not be overlooked for the business to be profitable. Some seed carried over from year to year may deteriorate in quality.

Setting a price

The price of native seed may range from \$2/kg to over \$2,500/kg. Seed price should cover production costs including: labour, equipment, cleaning and testing, storage facilities, and marketing. Remember to include crop share agreements in your budgeting. Other factors influencing price include current market supply and demand, seed quality and volume, and your target market. Most native seed is sold on a weight basis,

however, seed weight varies tremendously among species. For example, one gram of Slender Wheatgrass may contain only 250 seeds while a gram of Blue Grama Grass may contain over 1,800 seeds. Blue Grama Grass is also more difficult to grow, harvest, and clean than Slender Wheatgrass. Therefore, Blue Grama Grass may be more than 50 times as expensive as Slender Wheatgrass.

Native seed markets can be very volatile; prices may double within a period of weeks. For this reason many producers do not advertise a seed price or they set a time limit on the price.

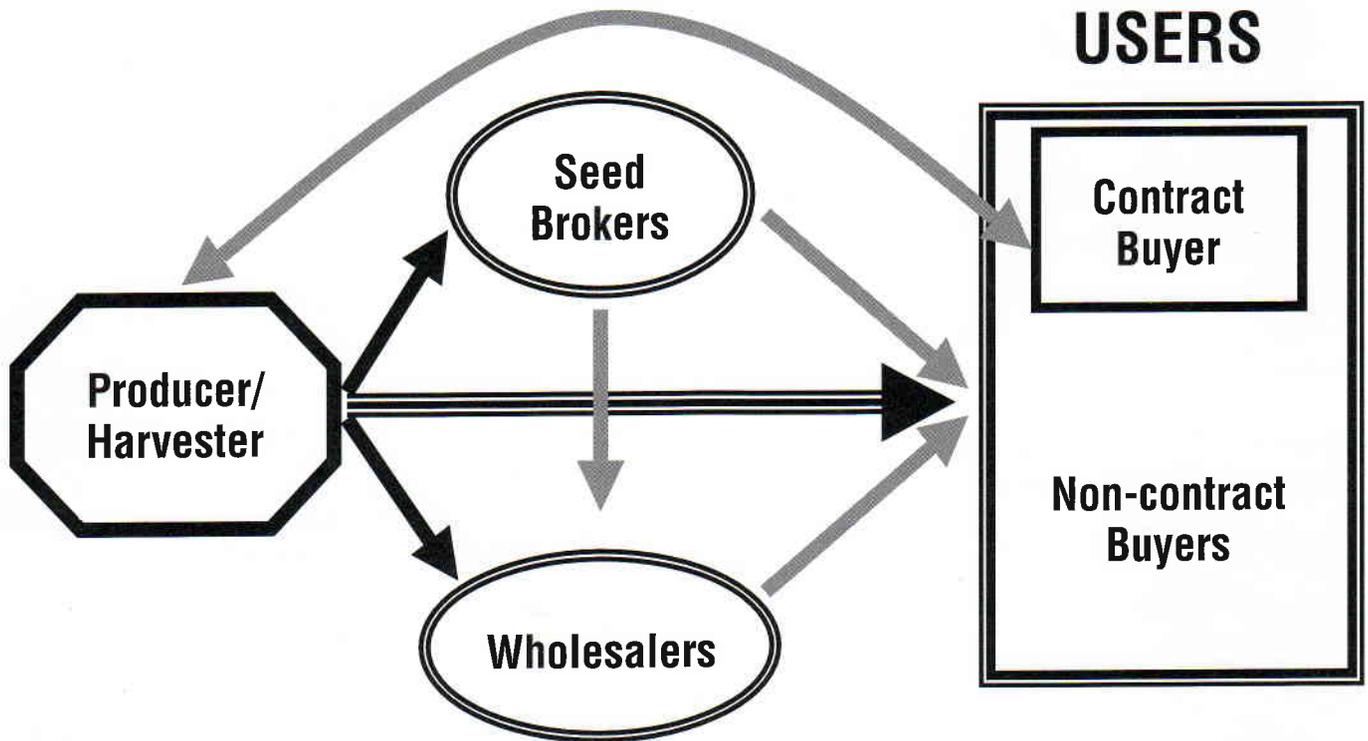


FIGURE 1. MARKETING OPTIONS FOR NATIVE PLANT PRODUCERS.

SUMMARY

Harvesting and producing native plants is a wonderful way to get in touch with nature and may be profitable if done appropriately.

Remember:

- Keep conservation in mind,
- Develop a harvesting plan, prepare,
- Know your site and plants,
- Timing and seed handling is critical,
- Quality is more important than quantity,
- Be prepared to market your seed,
- Expect supply of some species to increase and prices to decline, and
- Be realistic about prices if you want to sell.



NATIVE SEED PRODUCTION RESOURCES

Suggested Readings

?. Forage grasses: seed production. Saskatchewan Forage Council. (Ph: (306) 966-8663).

1999. Saskatchewan forage crop production guide. Saskatchewan Agriculture and Food. (Contact your Rural Service Centre or Saskatchewan Agriculture and Food 1-888-613-3975) (Note: this source discusses exotic species production as well.)

Abougendia, Z. 1995. Seeded native range plants. Grazing and Pasture Technology Program (GAPT) and Extension Service, Saskatchewan Agriculture and Food. (Contact GAPT at Ph: (306) 757-9499)

Joyce, J. 1993. Native plants: exploring grass seed production and markets. Prepared for Agriculture Canada, Prairie Farm Rehabilitation Administration and Ducks Unlimited Canada.

Looman, J. 1982. Prairie grasses identified and described by vegetative characteristics. Agriculture Canada Publication No. 1413.

Looman, J. and K.F. Best. 1979. Budd's flora of the prairie provinces. Agriculture Canada Publication No. 1662.

Moss, E.H. 1983. Flora of Alberta. 2nd ed. Revised by J.G. Packer. University of Toronto Press. Toronto.

Murell, D., P. Curry, G. Kruger, and G. Pearse. 1995. Production and marketing of native grass seed. (Contact your Rural Service Centre or Saskatchewan Agriculture and Food 1-888-613-3975)

Nernberg, D. 1995. Native species mixtures for restoration in the Prairie and Parkland Ecoregions of Saskatchewan. Mixed-Grass Prairie Habitat Restoration Project. (Ph: (306) 836-2022)

Pahl, M.D. and A. Smreciu. 1999. Growing native plants of Western Canada: common grasses and wildflowers. Alberta Agriculture, Food, and Rural Development, and Alberta Research Council. ISBN 0-7732-6138-9. 118 p. (Ph: (780) 427-0391).

Solutions 2000+ Management Consultants. 1997. Market assessment of native plant materials in Saskatchewan. Native Plant Society of Saskatchewan and Northwest Saskatchewan Grassland Association. (Contact the NPSS: (306) 668-3940)

Vance, F.R., J.R. Jowsey, and J.S. McLean. 1984. Wildflowers across the prairies. Douglas and McIntyre, Toronto. (Contact the Blue Jay Bookshop: (306) 780-9273)

Plant Identification Support

Grazing and Pasture Technology Program. Head Office: Ph: (306) 757-9499

Saskatchewan Wetland Conservation Corporation. Head Office: Ph: (306) 787-0726

Native Plant Society of Saskatchewan. Ph: (306) 668-3940

Mixed Grass Prairie Habitat Restoration Project. Ph: (306) 836-2022

W.P. Fraser Herbarium, University of Saskatchewan. Ph: (306) 966-4968

Production & Marketing Support

Native Plant Society of Saskatchewan. Ph: (306) 668-3940

Agriculture and Agri-Food Canada. Ph: (306) 695-3524 (production information)

Mixed Grass Prairie Habitat Restoration Project. Ph: (306) 836-2022

Harvesting Equipment

Prairie Habitats Inc., Box 1, Argyle MB, R0C 0B0
Ph: (204) 467-9371, Website: www.prairiehabitats.com

Seed Cleaning

Mixed Grass Prairie Habitat Restoration Project, P.O. Box 280, Simpson SK, S0G 4M0
Ph: (306) 836-2022

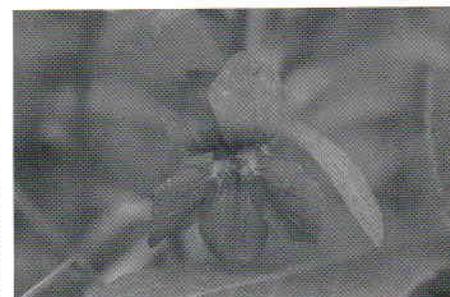
Newfield Seeds, Box 100, Nipawin SK, S0E 1E0
Ph: (306) 862-3468, Email: newfield.seeds@sk.sympatico.ca

Seed Testing Labs

20/20 Seed Labs Inc., Suite 201, 509-11 Avenue, Nisku AB, T9E 7N5
Ph: (780) 955-3435, Website: www.2020seedlabs.com

Discovery Seed Labs Ltd., Bay #4-1527 Ontario Ave., Saskatoon SK, S7K 1S7
Ph: (306) 249-4484, Website: www.seedtesting.com

Priority Lab Services, Box 1180, Nipawin SK, S0E 1E0
Ph: (306) 862-4212





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