The Nature Conservancy

SAVING THE LAST GREAT PLACES ON EARTH

A Guide to Selling Native Prairie Seed in Nebraska

Cover Photo *Ground plum (or buffalo pea) pods at The Nature Conservancy's Niobrara Valley Preserve.*

A Guide to Selling Native Prairie Seed in Nebraska

by Chris Helzer

The Nature Conservancy
Eastern Nebraska Project Office

1228 L Street, Suite 1
P.O. Box 438
Aurora, NE 68818

(402) 694-4191
chelzer@tnc.org
www.nature.org/nebraska

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All photos by Chris Helzer.

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introduction

In the late 1990's, a group of conservation organizations led by The Nature Conservancy and Prairie Plains Resource Institute were actively involved with high-diversity prairie restoration work in Nebraska. The projects we worked on consisted of annual restoration plantings of several hundred acres in size using seed mixes of between 150 and 220 species of prairie and wetland plants. We felt that (although we still had room for improvement) the methods we had developed were consistently successful and potentially useful to a much wider audience.

Several efforts were started to help expand the use of high-diversity restoration using locally-harvested seed, with the goal of making that kind of restoration work a widely accepted conservation tool in the state. Partnerships were struck with other conservation organizations and with private landowners to help facilitate high-diversity restoration work on more land each year. The need for a written guide that summarized the techniques we used was recognized, and that guide has now been completed and widely distributed throughout Nebraska and beyond (*A Guide to Prairie Restoration in Eastern Nebraska* by Gerry Steinauer and others). The book is available for the cost of shipping through either Prairie Plains Resource Institute at (402) 694-5535 or The Nature Conservancy's Central Nebraska Project Office at (402) 694-4191.

We recognized that not everyone interested in doing restoration work was crazy enough to harvest seed themselves, as we were doing. Therefore, an additional effort was undertaken with the purpose of investigating and demonstrating techniques for the production, marketing, and sale of native prairie seed. The goal was to make that seed much more available throughout the state by providing information to existing and potential commercial seed producers. We built a small greenhouse, started some seedlings, and eventually set up two separate seed production nurseries. One of those nurseries is owned by The Nature Conservancy and the other by the Nebraska Game and Parks Commission. Because the goal was less to produce seed for our own use (although that was a nice side benefit) and more to try out different ideas, we kept plots small and tried a number of different techniques to see what worked best. In addition to producing the seed, we also worked through the logistics of cleaning, testing, labeling, and selling the seed to figure out the most efficient ways of making all of those things happen.

We still have a lot to learn, but this guide is a summary of what we know so far. It is intended to help anyone interested in producing and/or selling native prairie seed in Nebraska by describing the trials and errors we have gone through for the last five or more years. We hope that the guide will help encourage a small but growing number of people interested in producing local ecotype prairie seed, and that Nebraska will eventually support a thriving market for that seed. Then, anyone interested in prairie restoration will be able to purchase the seed they want readily and at a reasonable price. The effort is still underway, and we hope to have more information regarding potential markets for seed and other information in the next months and years. We encourage anyone interested in the prairie seed market to contact us to get updated information.

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types of native prairie seed

Commercially-available seed is broken down into several different classes, based on the original source of the seed and the amount of testing and breeding that has taken place to produce the genetics of the particular seed for sale. This guide is written primarily to encourage and facilitate the sale of locally-native (local ecotype) prairie seed, but many of the ideas would apply to other kinds of seed as well.

The Nebraska Crop Improvement Association (NCIA) is the certifying organization for seed and plant materials in Nebraska. It is a non-profit membership organization that tests, inspects, and certifies all kinds of seed and vegetative plant materials for all crops except potatoes. If you intend to produce any kind of certified seed you must become a member of the organization. You may not need to be a member if you simply harvest and sell seed directly from native prairies (more information on this below), but there are other advantages to joining, including access to seed production and sales networks, reduced rates on seed tests, etc. Contact information for NCIA can be found below at the end of the Testing and Labeling section of this guide.

The simplest kind of seed is local-ecotype seed, which is seed that has been harvested directly from a native prairie and has not been the result of any genetic breeding, selection, etc. This seed is often lumped in with "Common" seed, which refers to any

seed where there is no paper trail or official way of tracking its origin or any selective breeding that has taken place. However, not all "Common" seed is local ecotype seed, since that category can include seed harvested from anywhere, including stands of cultivar grasses, non-native species, etc. The use of local ecotype seed has been promoted by many conservation groups, including The Nature Conservancy, for use in prairie restoration efforts. If seed is harvested from a prairie and planted nearby in a cropfield or other restoration site with the same soil type, there is little risk of the seed failing to establish, failing to be adapted to the site, or bringing in genetics that could cause problems in the future. Simply, local ecotype seed is seed that is native and therefore well-suited and adapted to the area from which it comes.

Other classes of seed are based on the amount of intentional selection that has taken place in the process of seed production. The three general classes are 1) Source Identified, 2) Selected, and 3) Tested. Source Identified seed is essentially local ecotype seed that has been harvested from a site that was previously inspected by NCIA and can be tracked back to that original source. No additional selective breeding has taken place. Source Identified seed gives the buyer of the seed additional assurance that the seed has come from the native stand, if they are trying to buy local ecotype seed. Currently the Source Identified seed program is available for use in Nebraska, but it has not been recognized widely by buyers, so there is little reason to go through the process of certifying harvest sites at this time. In the future, this may be a very valuable way to link buyers and sellers of local-ecotype seed.

The Selected class of seed refers to seed that comes from plants that have gone through some kind of selection process, but where there is no proof of inheritance or origin. In other words, the plants that produced the seed have certain traits that have been selected for, but there is no way of tracking the original origin of the seed.

The Tested class of seed is that seed that comes from plants whose parentage has been tested and proven to possess particular traits, and for which the origin of the seed can be proven as well. Often Tested seed is released for sale as a named variety, which is essentially a way to trademark a genetically-selected line of plants. Seed from named varieties is either sold as Foundation, Registered, or Certified. Foundation seed is the original, first generation of seed that resulted from the final selection process. The seed harvested from Foundation seed plants is sold as Registered, and the seed harvested from Registered seed plants is sold as Certified. Most agencies and commercial buyers purchase Certified seed because there is a proven track record of the performance of plants that grow from that seed (see Marketing section below).

Another general term often used to describe seeds is "Cultivar", which simply refers to any seed which is the result of some kind of selection process. Most cultivars of prairie plants are grasses, although there are a growing number of forbs that are going through selective breeding processes.

A final, and relatively new, category of prairie seed is called an "Ecovar". Ecovars are made by harvesting seed from various sites within a certain region, planting them all in one place, and harvesting the seed from those that produce seed. In this way, the genetic variation from the entire region is captured, but there is no real selection for particular traits. The USDA-APHIS in Lincoln is currently producing a number of ecovars of native legumes, and have started to release seed from some of them. Depending upon the sources of the original collections, ecovars can be good solutions for consumers who want to use local ecotype seed but are unable to harvest or buy it. The genetics of these ecovars come from a wider geographic range than local ecotype seed, which should make them adaptable to many sites and changing conditions.

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the importance of local ecotype seed

The Nature Conservancy and many other conservation groups advocate the use of local ecotype seed for ecological restoration projects, and for any other revegetation or grassland planting projects when there is no compelling reason to use other types of seed. Using seed that is native to a particular area helps ensure that the seed will succeed in the place it is planted, and it eliminates many potential risks involved in using other types of seed. From an ecological restoration perspective, local ecotype seed also helps ensure that the local genetic diversity and integrity of the prairies within a local area are maintained and not diluted or polluted by genes from outside areas. These "foreign" genes have the potential to mix with local genes and make local plants less well adapted to their site, reduce the genetic diversity at the local level by swamping out the local genotypes, or both. Unfortunately, there has been very little research to validate or invalidate these concerns. Until that research takes place, The Nature Conservancy advocates the use of local ecotype seed whenever possible because it is the path of least risk.

There are several alternatives to local ecotype seed. These include non-native species, cultivars of native species, and wild harvested prairie seed from long distances away from the planting site. Non-native species have several potential disadvantages, the most important of which is that many of them become invasive under at least some conditions. There are numerous examples of non-native

grass species that have become ecological and agricultural threats as invasive species after they were introduced purposefully to serve an ecological or agricultural use. Some of these include smooth brome, Kentucky bluegrass, tall fescue, tall wheatgrass, Garrison's creeping foxtail, and reed canarygrass (reed canarygrass is a species native to Nebraska, but a non-native variety has become invasive).

Cultivars of native species, particularly grasses, can play important roles in erosion control plantings, pasture situations, biofuel plantings, and other situations where the use matches specific traits identified and encouraged during a selection process. They have a proven record of success that makes them useful in the areas where they are adapted for use. However, there are some scientists who are concerned that they can be detrimental because of the potential for swamping out local genetic diversity, and because they could reduce plant diversity when used in restoration projects by becoming so dominant that they outcompete other species. These assertions have not been well tested. As mentioned above, ecovars may be acceptable substitutes for local ecotype seed, depending upon how wide the geographic area of seed harvest was, and where the seed is to be planted.

Wild harvested seed from locations outside a local area can fail to establish well or survive, and that possibility of failure increases with the distance between harvest site and planting site. There is good data on areas of adaptability that help guide how far seed can be transported and used successfully. However, moving wild harvested seed far from a harvest site still has the potential to lead to detrimental effects on genetic diversity in local prairie populations. Again, much research is needed to investigate the potential threats of the genetic issues involved.

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seed sites/production

This guide will focus mainly on the marketing and logistical aspects of native prairie seed sales. Some brief information will be presented here on seed production and harvesting, but for a more thorough review of techniques, see *A Guide to Prairie and Wetland Restoration in Eastern Nebraska* by Gerry Steinauer and others.

Hand-screening seeds to remove large pieces of inert matter.

Harvest Sites/Production Plots

Seed can be harvested from several kinds of sites. The best choice depends upon the species you want to harvest and the amounts you want to collect. Many species can be collected from remnant or restored prairies very efficiently, either by hand or by machine. This works well for many of the more dominant forb (wildflower) species, including prairie clovers, perennial sunflowers, compassplant and rosinweed, spiderworts, and many others. Locating harvest sites by scouting for big dense patches of the target species—before harvest

time—is the key to efficient seed collection. When harvesting by hand, large amounts of seed can be collected very quickly from sites where a species grows in abundance and in clumps that are easy to harvest. The other important aspect of efficient hand harvesting is to harvest by handfuls rather than by picking seeds like you would pick berries.

One of our challenges every year is to train our seasonal staff to grab and pull off the entire tops of plants where the seeds are located instead of trying to pick only the seeds themselves from the plants. Very simple seed cleaning equipment can quickly separate seeds from stems and leaves later. It's important to maximize the time you spend harvesting and clean it up later when you can't be in the field.

Purple prairie clover is one of the most commonly used wildflowers in habitat plantings. It is a native legume and very showy. For some reason, white prairie clover, a very similar species, is harder to obtain commercially, and more expensive.

Machine harvesting (with a combine or seed stripper) can gather large amounts of seed quickly, but unless the patch is a monoculture of your target species, you get a lot of other species at the same time. This means you either have to market the seed as a mixture (see marketing information below) or separate your target seed from the rest with various seed cleaning techniques. We have done most of our machine harvesting on dominant grasses in prairies that have been burned in the spring to stimulate seed production and limit the flowering of exotic grass species. Occasionally we take a seed stripper or combine out to harvest other species like wetland sedges and a few forbs, but in most cases hand harvesting is equally efficient.

A 1974 Massey Ferguson combine used to harvest native grasses.

For some plant species, establishing production plots might be the best option for efficient harvest of seed. This is especially true for species that are difficult to find in the wild, occur in small scattered patches, grow in areas where it is difficult to harvest them, produce small amounts of seed, or produce seed only in years with adequate weather conditions. Production plots are essentially small garden plots where one species is grown in a monoculture for the purpose of seed production and harvest. Production plots can be established by directly seeding the species into the ground, or by growing seedlings in a greenhouse and then transplanting those seedlings into plots.

Starting production plots from seed is a good choice for perennial plants when you have a decent amount of seed to start with and when seedling production is not a good option. We have had good luck starting production plots both by planting seeds in rows and by broadcasting the seed. Normally it takes two years before the new plants produce seed. Unless your plot is small enough that you can effectively hand pull weeds the first year, it is most effective to let the weeds grow with your new seedlings during the first year and mow them down periodically to help allow light to hit your new plants and to keep the weeds from producing seed. Adequate watering is important during the first year to help your new plants compete and survive. Just prior to the second season of growth, you can use a pre-emergent herbicide (like crabgrass preventer in your yard) to help prevent weeds. The herbicide kills seeds as they germinate but will not hurt plants that are already alive and are just re-emerging from the soil in the spring. You will want to

reapply the herbicide several times during the season, as the label suggests, to prevent germination later in the season. The key to success with this kind of planting is to get adequate germination and survival of your new plants during the first year, so that by the second year your pre-emergent herbicide can take over.

Starting production plots from seedlings is a good option when greenhouse facilities and staff are available, and/or when very little seed is available. We have found that, with most species, if we start plants in January we can get them big enough to transplant by May. There are many options for pots, soil, and greenhouse designs, and the right answer for you will depend upon your particular situation. Once the plants are transplanted into the nursery plot, pre-emergent herbicide can be used immediately to prevent weeds—just as with the second-year seeded plots. Often, provided you apply adequate water and have productive soils, seed can be produced in the first year of the plot, although production often increases the second and third years as plants get larger. Another option for weed control is to use a weed barrier fabric—a very fine mesh plastic fabric—that allows water in but not light. You can punch holes through the fabric where you want your seedlings, and the fabric will prevent weeds from poking through in other places. Watering your plants with that kind of fabric is best done with a soaker hose or some similar watering system because water sprinkled on top of the fabric tends to run off to the edges before it has time to soak in. Using a mulch of wood chips or other material can be used as another alternative to the fabric when starting new seedlings, and may hold weeds off long enough for a canopy of native plants to establish.

Once production plots are started, proper maintenance is critical. Weed control is greatly helped by pre-emergent herbicides, but often selective mowing and hand-weeding is also necessary. Keeping plants watered is important, and can be difficult in large plots. One tool we've found to be useful is called a "traveling gun" irrigation system. Essentially, a traveling gun is a hose reel with a sprinkler on the end. The hose reel is powered by a water-powered

motor, which turns the reel as water passes through it. You pull the hose (and sprinkler head) out to the length needed, and then set the motor to pull it back in at the speed you want. That way, you can water long stretches of production plots at a time without having to use multiple sprinklers or having to move sprinklers from place to place all the time. It's important to decide on your watering method before you lay out your production plots to make sure you are as efficient as possible. It's also important to know how you plan to harvest seed from your plots before laying them out. If you will be hand-harvesting, it makes sense to leave alleys between rows so that you can reach all the seed from the alleys without having to trample plants. If you will be harvesting with a combine or other mechanical equipment, make sure to make your plots appropriately wide, and leave plenty of space at the end of the rows for the equipment to turn around.

A seed stripper that can be pulled behind an ATV. The brush strips seeds into the hopper behind it.

Seed production plot at Midewin National Tallgrass Prairie in Illinois, demonstrating the use of wood chip mulch to control weeds around seedlings. The mulch biodegrades over time, but by then, the seedlings will form a canopy that will help keep weeds out.

Seed Cleaning

Seed cleaning is simply the process of separating the seed you want from the inert matter (stems, leaves, pods, other seeds) as you prepare the seed for market. The amount of cleaning needed will depend greatly upon the market you have in mind. There are a number of different kinds of cleaning equipment on the market, and you will have to match the equipment to your specific needs. However, the basic cleaning of seed for most species is a fairly simple process.

This home-made "hammermill" was created from parts of an old riding lawnmower. Essentially, the seeds are sucked through a tube, beat up by the steel fan blades, and deposited in a hopper. The process knocks seeds out of pods and off of stems.

Once the harvested seed has been dried, the first step is generally to run the bulk seed through some kind of hammermill, or to otherwise knock the seeds from the stems and pods. This breaks pods open, knocks seed clusters apart, and generally loosens

everything up for the next step. With some species and harvest methods this step is unnecessary. Commercial hammermills can be found new or used from a number of sources. Prairie Plains Resource Institute uses a hammermill made by Speed King (model 615) and has had good luck with it, but there are others available as well. But it's not always necessary to use a commercial mill. Anything that knocks seeds around can be used. Both The Nature Conservancy and Prairie Plains have used a simple system consisting of a steel-bladed fan that sucks seeds through plastic tubes, through the fan blades, and into a hopper. Commercial leaf blowers that have the capability to vacuum leaves into a bag can perform the hammermill function as well if you just vacuum the seeds through the machine.

Using a screen from an old fanning mill is a quick way to separate seeds from chaff.

The second step is to screen out the bigger pieces of stems and pods by passing the seed through sieves or screens, by hand or with the use of a fanning mill. A fanning mill combines the screening process with the use of forced air that can blow out dust and other lightweight particles from the seed. Fanning mills are very useful (and fascinating) machines that can produce clean seed quickly. Old mills can often be found at farm auctions for very low prices, but it's critical to ensure that they come with screens. The screens often fall apart if they're not taken care of over time and the mill is no good

without them. "Clipper" is probably the most commonly recognized brand name for fanning mills, and they still make them today if you prefer a new model. There are a variety of other specialized cleaning machines that can be purchased if you have specific needs, but they are not covered here. In addition, many large seed companies will do custom seed cleaning (or "conditioning") for a price.

Deciding how clean your seed has to be depends entirely upon the market. If the seed is going to be planted with a seed drill or other similar machinery, the seed will have to be clean enough to feed smoothly through that equipment. If the seed is going to be broadcast, it often has to be much less clean. However, many agencies recommend higher seeding rates to landowners if they are going to broadcast seed, rather than drill it. That means that a landowner would have to buy more seed for the same number of acres if they decide to use the broadcast method. Make sure you know who will be using the seed and how it will be planted before you decide how to clean it.

Seed storage. Seeds should be stored in containers that allow the seeds to have access to air, not in tightly-enclosed containers. Using a temperature and humidity-controlled environment will keep the seed viability for a long time, but most seeds will maintain their viability for at least 2-3 years even in uncontrolled conditions.

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the nebraska seed law

The State of Nebraska requires that any seed be tested for purity, germination, and noxious weeds prior to being sold, and that the seller possess a current seed permit. The seed must also be labeled clearly, following specific guidelines laid out in the Nebraska Seed Law. This also applies to any transfer of seed from one person to another, if the receiver intends to plant the seed (it does not apply to the sale or transfer of seed from a grower/harvester to a retailer who will then test and sell the seed). A seed permit can be obtained from the Nebraska Department of Agriculture at a minimum annual cost of $50. Copies of the Nebraska Seed Law, and information on obtaining seed tests and permits can be found at the Department of Agriculture's website: *www.agr.state.ne.us/division/lab/seedtest.htm*.

The purity test tells the buyer how much of the bulk weight of the product consists of actual seed, versus stems, pods, and other inert matter. The germination test tells the consumer what percentage of the seed will potentially grow. Depending upon the exact test used and the kind of seed being tested, the test generally will report on the percent of seeds that germinated during the test, the percent that were alive but dormant, and the remaining percentage that were non-viable seeds. Germination tests are only valid for 9-12 months (depending on the species) and must be repeated if the seed has not been sold within that period. Finally, the noxious weed test reports any weed species that are listed as noxious. If seeds of noxious weeds are found, the seed from that lot may not be sold or transferred within the state.

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testing and labeling

As discussed, seed tests are an important part of marketing and selling seed. However, the Nebraska Seed Law and testing procedures were not designed with native grasses and wildflowers as the primary target. Because of that, we have developed some suggestions to obtaining a test that will meet legal requirements and also provide you and your customer with the information you both need.

Individual Species

Selling seed as individual species eliminates many of the complexities of the seed law. Take multiple small samples from various parts of the pile or container of seed, combine them into a single sample (check with the testing lab to see how large a sample they require for each species), and send them to the lab with instructions regarding which tests you want. Upon receiving the test results, a label can be printed and attached to that lot of seed (and any subdivision of that seed—bags or other containers—that you sell). The label must contain the results of the germination, purity, and noxious weed tests, along with other information specified in the Nebraska Seed Law. Often you will need to list the % of Pure Live Seed (PLS) found in the sample. This is a combination of the purity and germination test results. Read the law carefully (especially pages 5-10) to ensure that you understand the requirements for the particular kind of seed that you are selling. Requirements vary by species and by the way the seed is packaged.

Mixtures

If you are harvesting seed mechanically from a prairie using a combine or seed stripper, selling a mixture may be the most efficient option—eliminating the need to try to separate one species from the harvested mix. However, testing and labeling a seed mixture is much more complicated than the process for single species. If you want to label and sell the mixture as a diverse mix of native grasses and flowers, you will need germination and purity test results for every species in the mix that you list on the label. Because those tests cost about $50 each, this can be an expensive venture.

A mix of prairie species ready to be planted in a high-diversity prairie restoration.

There are, however, other options. You are only required by law to test germination for species that make up 5% or more, by weight, of the total mixture. Many times, mixtures harvested with a combine from a native prairie have only 3 or 4 species that reach that status—dominant warm-season grasses and maybe one or two dominant forbs. Most of the other species, even if they are common in the mixture, will not typically weigh enough to meet the 5% threshold. So you can instruct the testing lab to do a noxious weed test on your entire sample, but to only do purity

and germination tests on any species that make up 5% or more of the sample. Remember, though, that you can only label for sale those species that were tested. For example, with this scenario, you might have 50 or more species that show up in the sample you send to be tested, but you can only sell the mixture as "Big Bluestem, Indiangrass, and Illinois Bundleflower Seed", or whatever your "5% species" turned out to be. You have to be very careful about labeling protocol on this kind of mixture, because you want to represent your seed as a native prairie mix, but you can't legally sell species that haven't been tested.

Fortunately, the results of the seed test can help you out. When the staff person at the lab sorts your seeds, they will note any species that they see and can identify. Those species identified, but not tested for purity or germination, get listed on the test results as either "Other Crops" or "Weeds", along with the number of seeds from each found in the sample you submitted. Because the labs don't yet have a comprehensive way of identifying all the native plant species of Nebraska, some of the species will be listed only to genus, but this is often sufficient for representing the kind of diversity found in your mixture. It's often interesting to see the species that get listed as "Crops" versus "Weeds" under the current testing and legal protocols. For example, most wildlflowers end up as "Crops", but perennial sunflowers, sedges, and some other species usually end up as "Weeds". In addition, species that many of us consider to be weeds, such as sweet clover, end up in the "Crops" category. Regardless, you can take advantage of those other listed species by including them on your label as species without germination tests.

Big Bluestem is the signature grass of the tallgrass prairie, but there is almost no local ecotype seed available for this species in Nebraska. It is easy to harvest large quantities by combine or seed stripper and it establishes quickly.

There are two laboratories in Nebraska that can test seed for you. We have worked with both on developing the most efficient manner to test and label prairie seed mixtures. There are numerous other laboratories across the country that are certified by the Association of Official Seed Analysts, but we have tried to work and develop relationships with laboratories here in the state.

Nebraska Department of Agriculture
Seed Testing Laboratory
3703 So. 14th Street
Lincoln, Nebraska 68502
402-471-2176

Nebraska Crop Improvement Association
(For NCIA members only)
267 Plant Science Hall
P.O. Box 830911
Lincoln, Nebraska 68583-0911
www.unl.edu/ncia

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marketing

Marketing is probably the most important part of a successful business, and the native prairie seed business is no exception. Figuring out the demand for the products you are able to provide and matching up your supply with that demand is critical to success. The potential customers for native prairie seed are a diverse group, each with its own specific wants and needs with regard to the product they are looking for. Below is a partial list of potential markets for prairie seed, based on the experiences and conversations we have had within the state over the past 5 few years. There are certainly a number of other possibilities, and many other doors will likely open as you begin making contacts and initial sales of whatever products you decide you can provide.

Markets for Individual Species

We have not gained much experience yet with marketing individual species. Many large seed companies are willing to buy seed from individual species, and then re-sell them in mixtures or as individual species. This allows the seed harvester or producer to sell seed without a seed test—although having a germination test will help both you and the buyer know the quality of the product being sold. Also, selling to a company who will re-sell your product means that you will get paid less than they will for the same seed. There are a number of seed companies in Nebraska and surrounding states who deal in native seed, and you can find them pretty easily through the internet.

Another potential market for seed of individual species is producers who want to start production plots. This is currently a very small market, and probably won't expand very quickly. Also, if they are going to use the seeds to start seedlings, they might not need very many seeds to do that. However, if someone is looking for a particular species that is not widely available, it might be worthwhile (economical) for you to harvest and sell it to them.

Other potential, but largely unexplored, ways to sell seed from individual species include selling seed packets through nurseries that sell garden plants or at farmer's markets, or selling seed directly to landowners who want to plant native plants. Innovative producers will surely find additional markets as well.

Prairie Larkspur flowers. Plants like this can be popular in flower gardens as well as for prairie restoration projects.

Markets for Seed Mixtures

Conservation Program Plantings (NRCS, NGPC, etc.)

Conservation plantings may be the most potentially lucrative market in the state. For example, there are more than 1 million acres of Conservation Reserve Program (CRP) land in the state, much of which is planted with native prairie plants. And there are a number of other programs available through both federal

and state agencies that provide money and support to landowners who want to plant grasses and wildflowers on their property. The major agencies involved in these programs include the Farm Service Agency (FSA), Natural Resources Conservation Service (NRCS), United States Fish and Wildlife Service (USFWS), and the Nebraska Game and Parks Commission (NGPC). In addition to those agencies, conservation organizations such as Pheasants Forever, Ducks Unlimited, The Nature Conservancy and others also help landowners with both money and logistical support on grassland plantings. To further facilitate (and complicate) the process, many planting projects are funded by multiple agencies and organizations that match their money against each other to increase the total amount available for the project.

Getting your seed used on these projects will take careful planning and good networking. In most cases, the agencies and organizations working with the landowner will design the species list for the planting (with input from the landowner), but the landowner is responsible for finding, purchasing, and planting the seed. Therefore, it is important to be in contact both with the agencies AND the landowner. The agencies often suggest a list of seed companies to landowners, and they develop their recommendations for species based at least partly on the availability and cost of seed for the species they want. Making sure that the agencies know you have seed available and working with them on the price they're willing to pay will get you a solid foot in the door. At the same time, if a landowner is familiar with you and your product, they may help influence the agency to include certain species or kinds of species on the list, either because they have talked to you about what might work well or because they have seen similar plantings with seed from your company.

Although things are slowly changing, the use of local ecotype seed on conservation plantings most often occurs only when the landowner insists on using that kind of seed during negotiations with agency staff. Most agency personnel are familiar with the most popular named-varieties of native grasses (i.e. Pawnee Big

Bluestem, etc.), and like to use them because they trust them to work. Non-cultivar species, or "Common" seed from native grasses have traditionally been seen as less robust, less likely to establish, and generally less suitable and trustworthy. However, since nearly all of the research comparing cultivar grasses to local ecotype grasses has compared them based on traits bred into cultivars (height, biomass, pest resistance, etc) it's not surprising that local ecotype seed has developed a poor reputation. It will be important for you to develop a track record of successful plantings using your seed to show agency staff that it can and does work. And, if landowners are familiar with your seed supply and the rationale you provide them for using locally-native seed, they are much more likely to insist on using that kind of seed on their own property.

Canada wild rye is a native cool-season grass. Most cool-season grasses sold in Nebraska are non-native and designed for erosion control or pasture situations. However, there are a large number of native cool-season grasses as well, but they are not well-marketed. Canada wildrye is one of the few for which adequate seed can be purchased, but nearly all of it is from a single cultivar variety.

Once a species list has been made for a project, the landowner will contact seed companies to get prices and availability for the species on that list. If they can get most or all of the species from one company, they are likely to do that. Also, most will go with the lowest price(s) available unless there is a strong reason not to. In many cases, the species list they get from the agency will not

only have the number and kind of species needed for the mix, but also recommended amounts of each listed by PLS pounds/species. These specific amounts needed for each species can make it difficult for smaller seed companies to provide everything needed for the project. The easiest way to meet the requirements would be to have tested supplies on hand of each species needed, but that may not always be possible unless you are in close contact with agencies to find out what species are most commonly on their recommended lists. Species lists for most projects rarely exceed 15 species, which simplifies things somewhat.

Depending on the flexibility of the agency staff person in charge, it may be possible for the landowner to obtain permission to use mixtures that you already have that are close to the recommended ratios. This is particularly true when the purpose of the project is prairie restoration or wildlife habitat, as opposed to erosion control or pasture establishment. The most difficult species to harvest in prescribed amounts are often the dominant grasses because it is difficult to hand-harvest adequate amounts from prairies, making mechanical harvest the only feasible option. If you don't have monoculture production plots of these species, you will likely have to harvest them mechanically from native prairies, which makes it very difficult to control the ratio of one species to another in the final mixture. However, harvesting and testing mixtures from various sites may give you the flexibility to merge those mixtures together into a combination that gets very close to what an agency asks for. For example, one site might have an abundance of indiangrass and switchgrass but not much big bluestem. Mixing that seed with a site that was heavy on big bluestem might get you close to the recommended ratio.

Recent changes have opened the door a little wider for the use of local ecotype seed in seedings designed for prairie restoration and paid for by NRCS. High-diversity mixtures of local ecotype seed can now meet the standards required by NRCS for prairie restoration if certain seed testing procedures are followed. The guidelines provided to NRCS staff for prairie restoration prescribe

a certain seeding rate for grasses and forbs (either lbs/acre or seeds/ft2). For example, the guidelines might require 10 lbs per acre of grasses and 1 lb per acre of forbs. However, there is usually no set species list or seed amount per species within those guidelines. As long as all of the species in the mix are native to the area and appropriate to the site, the landowner and agency personnel are free to use any mixture of species they decide is appropriate. They just have to ensure that the amounts of grass seed and forb seed per foot (or per acre) meet the overall guidelines.

From the seed provider's perspective, that means that only two seed tests are required for the seed—one for the grasses and one for the forbs. When we are providing a high-diversity seed mix for a project funded by NRCS, we will mix all of our grasses (and sedges) together and all of our forbs together, and have each of the two mixes tested separately. Then we, or the landowners, can mix the grass and forb mixtures together to get the right number of lbs or acre of each mix.

Mixtures of prairie species can be made by mechanically-harvesting prairies with a combine and/or seed stripper, or by mixing individually-collected species together (shown here).

Acreage or Other Landowners

Working directly with landowners, particularly recreational landowners and acreage owners, who are not using Conservation Program money from state or federal agencies to fund their planting can make the whole process much easier from the seed supplier's perspective. Many landowners are seeing the potential benefits of planting at least portions of their property to native prairie species for a variety of reasons, including aesthetics, wildlife viewing or hunting benefits, ease of maintenance, etc. Besides rural landowners, other potential markets include industrial and/or educational campuses, city parks and greenspaces, and others.

As a group, these potential consumers tend to be relatively uneducated about their options, and are likely to buy anything that provides tall grasses and colorful flowers. Most options currently available consist of a mix of native and non-native species that are quick to establish and provide a variety of colors for most of the season. Convincing potential customers to use local-ecotype prairie seed may be as simple as getting to them before they look into other options, or more difficult if they've seen those other options. If they are looking for aesthetics and low-maintenance, you can likely provide them with a relatively similar product to what others provide (and at a similar cost), and the fact that your mix is all species native to the state could be a key selling point. It will be important to point out the differences between what you can provide them and the "wildflower" mixes elsewhere on the market.

If the customer is interested in providing habitat for wildlife species like pheasants and deer, they may be looking for a mix of native grasses, non-native cool-season grasses, and non-native legumes. That combination has been the standard recommended by agencies for years. However, those recommendations have been changing recently, and most agency projects are using more native species, recognizing that the kinds of structure needed for wildlife species is largely a function of management rather than plant species. Also, many of the non-native species tend to become

overabundant within the planting, and/or invasive into nearby sites. One of the reasons that the change is happening so slowly is that seed for native substitutes for smooth brome, sweet clover, alfalfa, and other non-native species is not yet readily available at competitive prices. It is probably a good idea to contact biologists in your area to find out who is recommending native species, and refer potential customers to them for advice.

Cardinal Flower is a wetland/wet prairie flower that does well in flower gardens. Seed is very expensive by weight, but that can be deceptive because the seeds are extremely small.

Nebraska Department of Roads

In some ways roadside plantings are similar to the Conservation Program plantings described above. It is a very substantial potential market in the state, and one that is supplied by a very few vendors at the present time. The Department of Roads (DOR) normally works only with seed vendors who can supply all the seed for a particular project, rather than piecing together species from various sources. This means that to compete for a project, you have to have adequate supplies of all the species listed for use on the project, and then win the bidding process for that project. So even if you can assemble the species needed, you are not guaranteed to get the job. One positive note is that if you contact DOR, they will provide you with spec sheets for the projects

they will be working on, usually a year or more in advance. But the competition for the projects normally limits the number of vendors to the biggest regional companies, and if you are a smaller operation, it is probably easiest to contact the larger companies to see if you can provide them with seed from individual species and let them take the risk and headache of bidding on jobs and assembling mixes. However, as this guide is being written, DOR is undergoing a staffing change and review of their procedures for roadside plantings, so it would be a good idea to contact them to see if protocols have changed.

Nebraska Department of Roads
1500 Highway 2, P.O. Box 94759
Lincoln, NE 68509-4759
(402) 479-4499

Wildflower Garden Mixtures/Seed Packets

Native wildflower gardening is an emerging market in Nebraska that may provide very good opportunities for the sale of native prairie seed. Many gardeners are looking for hardy wildflowers that need less water and maintenance than many traditional horticultural varieties. However, at the current time, there appears to be no one marketing locally-native prairie species to these customers. Some nurseries do sell native species, but most do not discriminate between locally-native species, hybrids or cultivar varieties of species native in Nebraska and those with origins elsewhere. These "Wildflowers", therefore, that may or not be native to Nebraska, the Great Plains, or North America.

Illinois Tickclover is an example of a native legume and important wildlife habitat species. Legumes are desirable because they attract insects favored by game birds such as pheasants and quail, make large seeds for wildlife food, and increase the supply of available nitrogen in the soil.

The concept of Nebraska-native prairie gardening may be very marketable because of the combination of hardy, low maintenance plants and the idea of preserving the heritage of Nebraska's native plants and prairies. Because no one is currently promoting the idea specifically, it will take a great deal of public relations work, and good networking with nurseries and entities like the Nebraska Statewide Arboretum. The Statewide Arboretum does have a track record of working with native plants in gardening and landscape settings, but not with an emphasis on the exclusive use of locally-native prairie plants. Nurseries would likely be the easiest and most direct customer for native prairie seed. You could either market the seed to them to grow into seedlings for sale, or have them retail your seed directly to their customers.

A related idea is the sale of wildflower seed packets. Natural Resources Districts and other entities sometimes use packets of seed as public relations tools, giving them out at fairs and other events. These usually contain "wildflower" seed that is purported to provide colorful blooms over much of the season. Often these packets do not list the species included in the mix, but when they are listed, the list usually contains species that are non-native to

Nebraska. A seed packet of Nebraska-native species (5-10 species or so) that would provide good color and quick establishment in people's backyard gardens seems like it would be an easy sell. The cost of the seed for a packet would be tiny, and from conversations we've had with potential customers, packets could retail for up to $4 each. They could be sold at nature centers, nurseries, gift shops, etc. or sold to agencies or conservation organizations for them to give out at events. Clearly labeling and marketing them as the "Nebraska-native alternative" to existing seed packets would help set them apart from the competition. Be sure to carefully read the Nebraska Seed Law as it pertains to the testing and labeling of seed sold in packets.

Otherwise known as wild bergamot or bee balm, monarda is a tall showy native species. Many monarda species are used in gardens and other plantings, but most are from sources and species outside of Nebraska.

Growing and Selling Seedlings

Production and sale of locally-native prairie grass and wildflower seedlings is another untapped market at the current time. As mentioned above, most nurseries do not currently discriminate between native or non-native species, or if they do sell native species, they are not labeled as locally-native or not. Seedling production requires certain facilities and equipment (see *A Guide to Prairie and Wetland Restoration in Eastern Nebraska* for additional information), but apart from the start-up costs, we've found that the cost of producing seedlings is relatively low. Most of the cost is labor, and much of that can be minimized by producing large numbers of seedlings. If you harvest your own seed, that cost is

very low, and we have found that most prairie species are very easy to propagate and grow. Importantly, a nursery permit is required by the State of Nebraska to grow and sell (or transfer ownership) of seedlings. This permit can be obtained through the Nebraska Department of Agriculture's Bureau of Plant Industry at a minimum annual cost of $25 (more for larger operations). Your facilities will be inspected once a year by the state to look for pests and diseases that could potentially spread to other places through the transport of your product. Contact the Department of Agriculture for more information at 402-471-2394.

Prairie violets are a highly sought-after species by prairie restorationists. They provide habitat for regal fritillary butterflies, an increasingly rare prairie species, and they are also one of the earliest flowering plants in the prairie. Seed is difficult to obtain in large quantities from wild harvesting because the pods split open as soon as the seed is ripe. Production plots may be the most efficient method of gathering seed.

There appear to be two primary types of markets for seedlings of this kind. One is the nursery industry, where you would sell your seedlings to a nursery which would in turn retail them to their customers. This would require convincing the nursery that your product is something that their customers would want. A second option, which might help convince nurseries to take you on later, would be to sell the seedlings directly to the public at venues like farmers' markets. Trays of healthy looking young plants, with attractive color photos of the flowers the plants will produce, seems like it would be a magnet for the kinds of customers who go to farmers' markets, especially in large towns and cities. This kind of direct marketing would also likely bring a premium price for the product, with the downside being the labor needed to transport, set up, and sell the seedlings on the days the markets are open.

8

summary

Harvesting, growing, and marketing locally-native prairie plants can provide a number of benefits. First, it is a fantastic way to become more intimately knowledgeable about prairies and their diversity. It also provides a much needed service to those working to conserve and restore prairies. The availability of local seed in Nebraska is very small, and those who want to restore prairie communities appropriately have few options at the moment, other than to harvest seed themselves. Finally, it may turn out to be financially lucrative. Because there are so few people marketing truly-native prairie seed, a clever marketing scheme could net a lot of money.

A stiff goldenrod seed caught on the stem of the plant.

The trick from the seed producer's point of view is to grow the demand for seed along with the supply. At the moment, both are low, and it will be important to make the public aware of the importance (and existence) of local seed in addition to simply making that seed available. In addition, some seed that sells at a high price now does so because not much seed is available for that species. Providing a large amount of seed for that species could easily flood the market and drop the price quickly. Balancing all of these factors will be the key to success.

Notwithstanding the challenges, the need for local prairie seed in Nebraska is great. Awareness of the issue and need has been growing steadily, particularly during the last decade or so. Many organizations, including state and federal agencies, non-profit conservation groups, and others are promoting and using locally-native seed more than ever. With the growing interest and the need for restoration of fragmented landscapes, it's a great time to be involved in the production and marketing of prairie seed.

A 5-year old high-diversity prairie restoration at The Nature Conservancy's Dahms Tract near Wood River, Nebraska.

notes

The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.