Potential for Expanded Production of Native Rangeland Seeds in Western North America

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We conducted a poll of seed companies in western North America and received 8 written replies representing Washington (2), Montana (1), Wyoming (1), New Mexico (1), Colorado (1), California (1), and Canada (1). We asked respondents to "rate the following constraints to production expansion in order of importance" (with higher numbers being more constraining):

Constraints	Relative importance
Internal to business	
Land availability	26
Infrastructure capacity	26
External to business	
Market uncertainty	61
Availability of high-quality seed stocks	56
Lack of research about native seeds	46

ABSTRACT

As producers of native plant seeds, we contacted similar businesses, asked them questions about expanding their cultivated production of native plant seeds, and incorporated their responses with our observations to provide a "seed producers' opinion" on what is limiting native plant seed production in the western US and Canada. Here, we report the results of this survey and discuss common problems associated with wildland seed production from public lands and subsequent sale to the federal government.

KEY WORDS: seed collection, market price, seed increase, field production, federal agencies

NOMENCLATURE: Barkworth and others (1983); Welsh and others (1987)

INTERNAL CONSTRAINTS TO CULTIVATED PRODUCTION

Seed companies regarded internal constraints to production as less serious than external constraints. Currently, a good availability of "clean" acres are ready for planting, that is, acres whose weed populations have been reduced sufficiently for seed production. The clean-up process can take anywhere from 1 season to an entire crop rotation depending on field history and the intended crop. Even though clean acres may be available, consumers shouldn't expect large-scale production shifts over short time frames. Many producers plan fields well in advance and often cannot change plans quickly. In general, infrastructure capacity is adequate. For example, production expertise is available and seed cleaning and marketing infrastructures are good.

EXTERNAL CONSTRAINTS TO CULTIVATED PRODUCTION

Market uncertainty, primarily on the demand side, is the chief impediment to acreage expansion; thus, creation of a stable demand should be a top priority. Other exogenous demand factors con-

tributing to market uncertainty are price, crop insurance, technology, and the ability to attract capital. Retail price of seeds should be high enough to encourage producers and marketers. In our survey we asked producers and marketers what they considered a fair return on equity. The mean of responses was 37% for producers and 27% for marketers. Bearing in mind that both levels perform essential and separate functions, the total return on equity for the native seed market should be no lower than about 65% in order to encourage acreage and infrastructure expansion. This figure represents a perceived fair return on equity on items currently in production for which many production parameters have been well defined. To encourage production of experimental crops, a free-market return on equity would have to rise to the level of risk.

An influential and uncontrollable factor on the supply side is fluctuation in the "opportunity cost" of growing native grass seeds. Recent record low prices for major commodities like wheat have stimulated interest in growing native grass seed crops. Now is a fortuitous time for acreage expansion of natives, but when wheat prices increase, interest in native seeds will decline proportionately unless there is a concomitant rise in native seed prices. Such competing uses for land should be borne in mind when evaluating the prospects of maintaining native seed production levels.

With few exceptions, traditional lenders are reluctant to loan money for native seed crops, harvesting equipment, and cleaning plants. Banks simply cannot assess the risks of native plant cultivation; they see extreme and ruinous fluctuations in the seed market as too risky to fit their loan portfolios given the absence of crop insurance. When banks do loan money, they tend to panic if prices fall and they frequently force producers to liquidate at market bottom. Neither are marketers in a position to lend to producers because they don't have the financial depth, and market uncertainty makes such a venture too risky. Any government loan program to address the capital issue would likely underestimate risks involved and suffer a high default rate. Some vertical integration of producers into marketing and vice versa is occurring at a cautious rate because banks are willing to loan on established asset bases and cash flow. Crop insurance may be a legitimate tool for expanding production in well-established native grasses (Poaceae) such as western wheatgrass (*Pascopyrum smithii* [Rydb.] A. Love), thickspike wheatgrass (*Elymus lanceolatus* [Scribn. & J.G. Smith] Gould), and bluebunch wheatgrass (*Pseudoroegneria spicata* [Pursh] A. Love), for which production history provides enough data to assess the insurance risk. Crop insurance for experimental crops is not feasible.

Photo by Steve Feigner

*Rough bentgrass (*Agrostis scabra *Willd. [Poaceae]) growing at the USDA Forest Service J Herbert Stone Nursery in Central Point, Oregon.*

Adequate supply of high-quality seed stocks for planting was rated second to market uncertainty in deterring new planting. Traditionally, the USDA Natural Resources Conservation Service's Plant Materials Centers (PMCs), situated at 27 strategic locations throughout the nation, have supplied new growers with foundation or registered class seed through state Crop Improvement Associations. With budgetary cutbacks and high Conservation Reserve Program (CRP)-based demand for planting seeds, supplies of planting seeds are very low and probably of lesser quality than in the past. Increasing available quantities may require 2 to 3 y. Encouraging fledgling native seed growers to plant low-germination or weed-contaminated seeds is counterproductive because failure is nearly guaranteed. The PMCs must be included in CRP program planning to ensure adequate supplies when they are most needed. PMCs have also played an important role in developing and disseminating production technology for new species. While private developers conceal proprietary technology, PMCs measure their success by their ability to disseminate it.

Inadequate research on native plant seed production was the third most important deterrent cited in the survey responses. This inadequacy is greatest

Photo by David Steinfeld

*Production beds of fragrant popcornflower (*Plagiobothrys figuratus *(Piper) I.M. Johnston ex M.E. Peck [Boraginaceae]) at the USDA Forest Service J Herbert Stone Nursery in Central Point, Oregon.*

for forbs. Forbs are very exacting in their requirements and little is known about most of them. For new forb species, 5 to 10 y of experience may be required to answer basic management questions such as soil adaptation, water and fertilizer response, seed dormancy, and seeding requirements. Two to five years of seed increase from small-scale blocks may be required before sufficient seed is available for planting of normal-sized fields, assuming no delays are incurred. Any expectation that a species such as sulfur buckwheat (*Eriogonum umbellatum* Torr. [Polygonaceae]) will be ready for field production next spring or this decade is unrealistic unless preceded by adequate research.

The greatest body of knowledge available about bringing new species to market resides within the PMCs and Agricultural Research Stations. Therefore, for any government agency to ignore these networks is detrimental to both growers and users of native seeds. Without the federal research infrastructure embodied by these institutions, attempts to bring new forb species to market by collecting and distributing seeds to farmers for direct grow-outs will likely fail. We urge the reversal of the current trend of funding reductions for PMCs.

A need for research was cited as the third most important external constraint. Environmental restrictions such as burning bans and the lack of chemical registration for minor and experimental crops affect the outlook for acreage expansion and new species development. Burning bans may inhibit production in some geographical areas and favor it in others. Without field burning to control weeds, increased herbicide use will be necessary. The difficulty of registering herbicides and pesticides for use in new crops is a major hurdle to encouraging the production of native forbs and shrubs. Without their availability, weed control can easily surpass US$ 12,350/ha ($5000/ac) and yields can drop dramatically. A "native forb and shrub seed" classification on herbicide labels could help aggregate species sufficiently to encourage manufacturers to include such a registration on their labels. This would have 2 effects, namely to bring producers into compliance with the law, and to encourage dissemination of information regarding chemical products and rates.

WILDLAND SEED HARVEST

Harvesting seed directly from wildlands is often limited by 3 factors: 1) lack of capital for collectors; 2) variation in collection permit policy among districts of the USDI Bureau of Land Management (BLM); and 3) the common federal practice of permitting the same collection area to more than 1 group of collectors in the same year. The use of undocumented foreign labor for seed collection has increased dramatically over the last 5 y, making it more difficult for legitimate suppliers to compete. Marketers of wildland shrub seeds have shifted the collecting burden to subcontractors and often have become so divorced from collecting that they can no longer guarantee the quality or origin of their product. Vegetation removal fees, that is, seed-collecting permits issued by the BLM, added US$ 22 to $44 per kg ($10 to $20/lb) of pure-live seed (PLS) of big sagebrush (*Artemisia tridentata* Nutt. [Asteraceae]) during fall 2000.

The difficulties of providing adequate supplies of shrub seed can be illustrated by the example of big sagebrush. Wildland collections of big sagebrush could expand through steady demand and technology dissemination to geographical areas not currently being harvested. Such is the case in Washington state's Columbia Basin, although beginners' failure rates are very high. However, the suitability of this seed source for use in the high-demand area, that is, the Great Basin (Nevada and portions of surrounding states), is unknown. Additionally, as the market expands and new players proliferate, plant misidentification and quality control may become greater problems.

To date, cultivated seed production of big sagebrush has failed for both production and demand reasons. A major

problem with this species is that its seeds are short-lived, frequently surviving less than 18 mo. Thus, stockpiling large quantities by either industry or government is very risky. Additionally, high-demand years, typically characterized by widespread wildfires, are usually associated with below-normal precipitation. Frequently only drought-damaged native seeds are available at the time of greatest need. Further research into big sagebrush seed longevity and storage is essential if large reliable supplies are to be realized. Potentially, cultivation could circumvent wildland stand loss due to encroachment of fire and noxious weeds.

The current BLM practice of contracting for wildland big sagebrush harvest in September, before the extent of the fall harvest is known, represents a high risk to collectors and adds much to seed costs, maybe as much as an extra US $44 to $66 per PLS kg ($20 to $30/lb). Conversely, big sagebrush seeds are expensive to collect and it is usually accomplished with poorly capitalized groups, so that purchasing delays may discourage such efforts altogether. A compromise approach, in which BLM would contract for some seeds in September, some in October, and for its remaining needs in December or January, merits discussion. This would encourage later harvests by those unable to assume the great risk of a September bid.

SUMMARY

While demand for native seeds is increasing, the ability of the industry to respond to this demand is limited by both internal and external constraints, affecting either supply or demand. Government could improve the quantity and quality of the seeds it purchases by encouraging high-quality seed sources, supporting technology development by the PMCs, conducting crop pesticide research, and streamlining the permitting process for wildland seed collection on public lands.

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