

INTRODUCTION TO THE SASKATCHEWAN HERB RESEARCH CENTRE

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In search of new opportunities for diversification of the agri-food industry and in recognition of growth potential of the herb and spice industry, Saskatchewan Agriculture and Food provided financial support for establishment of the Saskatchewan Herb Research Centre (SHRC) in May 1994. The Centre is financed as a three year-project by the Agriculture Development Fund and is housed at the Department of Horticulture, University of Saskatchewan. This is the first Centre of its kind affiliated with a university in Canada.

The herb industry has been experiencing dramatic growth worldwide in the recent years. The major reason for this trend is revived interest in alternative health care treatments and pharmaceuticals from natural sources. It is estimated that the growth rate of the American medicinal herb industry alone exceeded 20% per year. Herbs in variety of forms (teas, tinctures, tablets, capsules, ointments) became widely available commercially as over-the-counter pharmaceutical products and/or food supplements. Its annual sale on the world market reached over \$4 billion. In 1992 herbal medicine market in U.S.A. and Canada was estimated at \$970 million and \$84 million, respectively.

Demand for herbs and herb-derived products for variety of other applications, such as food flavourings, ingredients for the cosmetic industry (fragrances, creams, lotions), industrial chemicals (insecticides, specialty lubricants), and feed ingredients, is also on the rise.

Despite all these developments, there is only a minimal commercial production of herbs in Saskatchewan. For the first time in 1994 spearmint was grown at around 800 acres in Outlook area; it is a source of essential oil used in food and cosmetic industry. Borage was grown at estimated 4000 acres for its seed oil, rich in gamma-linolenic acid, and marketed as a food supplement. Over the last 3-4 years, however, a handful of enthusiastic and determined herb growers have been testing numerous medicinal plants for their overwintering capabilities in small plots. Their encouraging preliminary results enforced with the dramatic growth rate of the health food industry around the globe, and particularly in North America, are indicative of a need for more studies of herbs.

In 1994 spice crops such as coriander, caraway, dill, fenugreek and cumin were grown on over 15 000 acres across the province. These seed crops are a source of essential oils, mainly destined for the food market. None of these crops were grown locally in any appreciable quantities 10 years ago.

It is noteworthy that over the last three years membership to the Saskatchewan Herb and Spice Association has increased several folds (200 members in 1994 vs. 40 in 1991). In addition, 10 companies entered the field of production and/or processing of herbs and spices, e.g. **Bioriginal Food and Science Corp.** and **Fytokem Products** of Saskatoon, **Springbank Herb Farm** of Speers, **Canadian Aromatic Oils** of Outlook, **Prairie Essential Oils** of Kipling, **Northern Essentials** of Prince Albert, **Assiniboia Herb & Spice Co-op.** of Assiniboia. Two companies also became active in vegetative production of medicinal plants: **Prairie Plant Systems** and **Microgro International.** **AU these** recent developments are industry driven and support the notion of strong interest in herb and spices as alternative cash crops for Saskatchewan.

In response to the above developments, the SHRC was created to:

- provide leadership in research and development for the Saskatchewan herb industry;
- establish collaboration with other research groups at and around the University and coordinate research on herbs;
- establish a laboratory for quality evaluation of cultivated and wildcrafted medicinal herbs;
- generate and transfer information on herbs and herb-based products to the industry in the province.

At the present time the SHRC is focusing its attention on 24 herbs that have been identified as having significant economic potential for Saskatchewan. They are the following:

1. Bearberry/ Kinnickinnick (*Arctostaphylos uva-ursi*)
2. **Calamus** root (*Acorus calamus*)
3. Chickweed (*Stellaria media*)
4. Dandelion (*Taraxacum officinale*)
5. Echinacea (*Echinacea angustifolia*, *E. purpurea*, *E. pallida*)
6. Elecampane (*Inula helenium*)
7. Evening-primrose (*Oenothera biennis* L.)
8. **German** chamomile (*Matricaria chamomilla*)
9. Ginseng: Oriental (*Panax ginseng*), American (*P. quinquefolius*), Siberian (*Eleutherococcus senticosus*)
10. Goldenseal (*Hydrastis canadensis*)
11. Horsetail (*Equisetum arvense* L.)
12. Licorice root (*Glycyrrhiza glabra*)
13. **Milk** thistle (*Silybum marianum*)
14. Mint (*Mentha spp.*)
15. Pitcher plant (*Sarracenia spp.*)
16. Plantain (*Plantago spp.*)
17. Red-osier dogwood (*Comus stolonifera*)
18. Sarsaparilla (*Aralia nudicalis*)
19. Seneca root (*Polygala senega*)
20. **Stemless** ladyslipper (*Cypripedium acaule*)
21. Stinging nettle (*Urtica dioica*)
22. Valerian root (*Valeriana officinalis*)
23. **Yarrow** (*Achillea millefolium*)
24. **Feverfew** (*Tanacetum parthenium*).

Out of these **24** herbs, Echinacea, German chamomile, goldenseal, milk thistle, valerian root, and fever-few are believed to have the best market potential, while horsetail, seneca root, stinging nettle, and yarrow are believed to have reasonably good market potential.

The Centre is currently developing:

- a herb database with information on production, processing, and marketing of 24 medicinal and aromatic plants of commercial interest listed above. The database also covers botanical description, ecology and distribution, ethnomedicinal uses, chemical constituents, pharmacological activities, nutritional and toxicological information, information on clinical trials, current research and references.
- chemical fingerprints of selected medicinal herbs from the above list, that are complementary tool in determining botanical authenticity of the plants. Herbs are often

improperly identified, particularly at the species level, and if administered, may cause serious adverse reactions. Chemical fingerprints also serve as fast methods for detecting intentional adulteration of botanical products, which is a real danger in the fast growing and loosely regulated market of herbal remedies.

- protocols for quality evaluation of selected herbs. Analytical methods for standardization and quality determination of crude herbs and botanicals are not available in public domain, but are considered to be an important marketing tool for local herb preparations. The lack of quality assurance program approved by the Health and Welfare Canada, and the Food and Drug Administration in U.S.A., is viewed as a main obstacle in accepting herbal remedies as alternative therapeutic agents. The SHRC may also provide limited support to the spice industry, particularly in the area of quality.

The current activities at the SHRC are initial steps toward establishing a laboratory for quality evaluation of herbs, and a research facility solely dedicated to herbs. Development of new, natural, chemically active substances for variety of applications, eg. phytochemicals, veterinary drugs, food flavourings, cosmetic ingredients, feed ingredients etc. are of interest to the Centre. All information, resources and networking channels generated by the SHRC will be shared with the interested collaborators and industry representatives.

The SHRC is hoping to expand its activities into herb production if funding for the establishment of herb production program becomes available. It is recognized that successful development of medicinal plant industry depends to a great extent of the quality of raw material. The quality, that is the concentration of active compounds in medicinal herbs, and content and composition of essential oils in aromatic plants, is dependant on the genetic makeup of herbs. Therefore, efforts are needed experimental cultivation of selected herbs, and introduction of those species that show promise of success into field scale cultivation. More attention is planned to be given to domestication of medicinal plants grown in the wild, particularly those used by Aboriginal people in northern Saskatchewan.

In long term, the SHRC is expected to assist in increasing the visibility of the herb industry in Saskatchewan and to play an important role in finding and advocating use of medicinal herbs, spices and natural compounds thereof. For further inquiries please contact Branka Barl at tel. 306-966-5868, and fax 306-966-8106.