Medicinal and Aromatic Plants in Manitoba: Trends in Industry Development

[Spice Crops | Medicinal/Aromatic Herbs]

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How quickly things change. With the loss of the Crow benefit last summer, many of us would have predicted a very intense interest in the alternatives to wheat. Well, wheat is up, and the interest in oilseed and special crops is down. Even so, there are a few who are intensely interested in some of the crops we are gathered here to discuss. I'll give you an overview of what is currently happening in Manitoba in regards to aromatic and medicinal plants.

Spice Crops

Caraway. Caraway seed is used in baking, cheeses, and other foods. Most years there will be a few thousand acres of production on the Prairies, between 1,000 and 2,000 in Manitoba. Contracts to grow caraway seed are typically difficult to find, but right now a processor in Western Manitoba is actively soliciting growers for caraway seed--this is literally an unheard of situation. Caraway is a biennial species, meaning it doesn't set seed until its second year. It is often sown with a nurse crop to provide a harvest of something in the establishment year. By late June in the second season, the crop is generally well into flowering, and by early August it is typically ready for harvest.

Coriander. Like caraway, there have typically been 1,000 and 2,000 acres of coriander in Manitoba. Coriander is a favoured nurse crop for caraway. While the pricing is not nearly as attractive as caraway, the caraway processor I spoke of is offering to take coriander from those growers who wish to use it as a nurse crop. We have attempted to grow coriander under zero-tillage, with good success. One of the main limitations is that the only broad spectrum herbicide registered for coriander and caraway is Edge (ethyl fluralin), technically a preplant incorporated herbicide. However, zero-tillers in Manitoba have been experimenting with surface-applied (non-incorporated) Edge in other crops, with favourable results. I expect that some experimentation with surface-applied Edge in caraway and coriander will be taking place in due course.

Fenugreek. Here's something relatively new to the Prairies--Fenugreek is used as a component of curry powders. Although we seem to be able to grow it quite well, the market opportunity for Prairie fenugreek production appears to be small, and we have had no commercial production attempts in Manitoba--I keep hoping that some processor will exploit some of the non-spice potential of fenugreek--extracting its dietary fibre and other components.

Cumin. Cumin seed has not yet been grown commercially in Canada, but appears to have some potential. It is used for flavouring meats and stews, and like coriander and fenugreek, is a

component of curry powder. It looks like there is good demand for cumin seed, and the price seems favourable, too. However, the plants are small, leading to a challenging (potentially frustrating?) harvest; and good stands have been difficult to obtain. Also, flowers are sensitive to high temperature, resulting in poor seed set. So the real potential of this as a new crop for Manitoba is still unknown.

Medicinal/Aromatic Herbs

Now we are in for something completely different. The crops we have talked about so far are grown on a scale of quarter sections and not quarter acres, using the typical line of full-sized tractors, seeders, sprayers, swathers, and combines. The crops we are going to talk about next require a bit of a paradigm shift--different production, different scale, different management, and different marketing. In fact, it's helpful to have an attitude like the one expressed on my friend's hat: "Of all the things I've lost, I miss my mind the most." If this is how your neighbours regard you, you are probably on the leading edge of innovation.

Essential Oil Crops. Sometimes mints are grown for their leaves, but what gives the leaves their flavour is the essential oils contained in the plant tissue. There are a number of species that are grown for extraction of these essential oils, including mint and dill for flavouring oils, and monarda and lavender for fragrant oils. There is commercial mint production on the Prairies.

These crops are typically cut with a mower, then chopped into wagons using a forage harvester. Now these are not your ordinary forage wagons - these are called distillation wagons, and when they are full, they are hauled to a distillation plant, sealed up, and connected to a source of steam. The steam releases the oil from the plant tissue and carries the oil out of a collector. All this happens on the farm--it's the oil that is sold off the farm. As you can imagine, there is a rather high capital investment required to set up this kind of operation, and a characteristic of essential oil markets is that prices are very volatile--not for the faint-hearted! There is no commercial mint production in Manitoba (that I know of)--but in one attempt to establish mint, the result was winterkill. This patch had poor snowcover, and all the rootstocks were killed. The would-be grower was lucky and had not yet invested in any distillation apparatus, so the learning experience was relatively inexpensive. Overwintering is not impossible mind you--it is necessary to take care in field selection, mulching, and prefreeze up irrigation, if available.

A number of years ago, there was an attempt made to establish a distillation facility in south central Manitoba to extract dill oil from the plant tissue. The effort went bust due to low dill oil prices just when production came on line. One of the characteristics of essential oil markets is price volatility. It seems to me that it might be prudent to set up distillation plants on the basis of perhaps two or three or more essential oil crops rather than just one.

Ginseng. The mystical ginseng root. Used for millennia by the Chinese as a medicinal and all-round feel-good substance--today there is growing clinical support for some of the traditional claims. At $35 - $50/lb for dried root, this seems like a very lucrative crop, and it has been grown successfully in Manitoba--though I should tell you that up until a few years ago, the so-called "experts" would have insisted it couldn't be done--but it is not for the faint of heart. An acre of ginseng might gross $80,000 to $100,000, but it will take a great deal of management attention and labour, and that acre will take a good $40,000 in expenses by the time it is harvested. Seed is very expensive, the plant is a shady-forest species so it needs to be shaded by a structure. Weed control is largely by hoeing and pulling, and multiple sprayings are required to keep diseases in check. While there have been many inquiries, there hasn't been a huge increase in the number of commercial scale growers in Manitoba. Our first grower's experience was encouraging enough to him that he has sown more, this time under polypropylene shadecloth instead of wood lath. I have also dealt with a couple of people interested in the possibility of reducing the cost of production

(but also the per acre yield) by growing ginseng under the shade of a shelterbelt. I have not heard about anyone successfully following through on this.

Echinacea. *Echinacea angustafolia*, or Purple Coneflower is native to the southern Prairies. The medicinal properties of Echinacea have been utilized historically by natives and pioneers used to treat everything from snakebite to saddle sores, but recently there has been clinical evidence to show Echinacea can stimulate the immune system. This is driving increased interest in Europe and North America. It takes at least three years to achieve a marketable sized root, and cultivation has several challenges--like sourcing seed, getting it established, and marketing it. But there is growing interest in the possibilities of cultivating this herb.

Typical of many native species, Echinacea seed has a high level of dormancy, and establishment for cultivation purposes typically involves both stratification and establishing seedlings in pots or flats, then transplanting successfully established seedlings. Stratification is accomplished by storing the seeds in moist soil at 4°-5°C for a month or two. We made the inadvertent discovery that by leaving the seed in the stratification medium (moist soil) in a warm environment for 24 hours or so, to pre-germinate, we could then sow the seed directly in the field and achieve a high level of establishment.

Senega root. I regularly get inquiries about the possibility of cultivating Senega Root--for which we have a long history of wildcrafting in Manitoba. I know little about this, but Dr. Norm Kenkel and a graduate student in the Department of Botany at the University of Manitoba have been examining the ecology of Senega root, and have worked out a technique involving both stratification and scarification to achieve a high level of germination. The next step hopefully is to attempt to establish it in the field, though they have not yet been able to pursue this.

Borage. As a fresh salad herb young borage leaves are known for their cucumber-like flavour. But a different interest in borage has sprung up in recent years, with the discovery that the oil in borage seed is high in a compound called gamma-linolenic acid, or GLA for short. This oil has a recognized medicinal value for people suffering from aliments such as diabetes, stress, aging, and PMS. A company in Saskatoon extracts borage oil and contracts up to about 3,000 acres of production annually, some of which is in Manitoba. Contracts are apparently hard to get, but obligatory if you want to market your crop.

Besides marketing, the other big challenge in growing borage for seed is that it starts flowering in July and doesn't quit until you swath it. If the seeds would just stay put, no problem. But they don't--as soon as a seed is mature, it becomes very prone to dropping off the plant. In practice, it is difficult to harvest more than about 20-30% of the seed that is there. This has some people dreaming of giant vacuum cleaners to harvest in several passes, before the seeds actually drop.

Hemp. While we are on the subject of gamma linolenic acid, I'd like to mention hemp. There's been an incredible amount of hype and interest in hemp in the last year or so. We had an opportunity last season to begin evaluating hemp to see if the hype has any substance to it. The main claim to fame of the hemp plant is the fibre in the stalk. The stem in cross-section shows a green "bark" containing very long, strong fibres. These are the fibres that have been used for untold centuries to make clothing, rope, twine, and paper. The whitish core, called "hurds" is very light and corky, but contains some very short fibres.

Hemp seed is actually a good source of oil that has been used historically for applications like paints and varnishes, as well as for edible purposes. We have had some of our hemp seed evaluated for the quality of its oil and here are the highlights:

- High in gamma-linolenic acid--at 2-3%, high compared with seed oils typically--also high

in linolenic acid--about 50-55%;

- High in tocopherols, natural antioxidants which not only counter the instability of oil high in polyunsaturates, also recognized as nutritionally valuable in their own right;

- Relatively high in sterols (though not unusually so compared with other plant oils) sterols block cholesterol absorption--if consistently high, extraction of the sterols as a separate pharmaceutical component could be warranted.

All of these things suggest that hemp seed oil could be a relatively high-value specialty oil.

Horseradish. A Winnipeg company contracts a small but growing acreage for the purpose of extracting a high-value minor component: horseradish peroxidase, used in medical and scientific test kits. I think this is an interesting model to exploit for other crops--extracting higher value components to add value.

Herbs. While commercial culinary herb production is very small in Manitoba, a couple of interesting initiatives include a cooperative herb growers group that is trying to identify good commercial opportunities from among the more than one hundred herbs in their collective experience, and a greenhouse enterprise growing fresh herbs for restaurants in Winnipeg.

Garlic. You may not readily think of garlic as a herb, but it certainly is...an aromatic plant which makes for aromatic people! --with both culinary and medicinal applications. There are several growers in Manitoba experimenting with suitable planting material and methods.

Peppers. Chili peppers. Spice? Herb? Vegetable? Does it matter? Market opportunity exists for Manitoba grown hot peppers, which must be sown indoors and transplanted out in spring, and there is some serious interest in commercial scale production.

Irrigated Production Possibilities. Finally, while it is mostly potatoes and some vegetables that are under Manitoba's irrigation rigs, there is considerable interest in identifying alternatives for irrigated production, which may include herbs--both medicinal and culinary--and other aromatic plants. Considerable energy is being spent in this effort, particularly with the leadership of staff at the Manitoba Crop Diversification Centre.

Although aromatic and medicinal plants are not new to Manitoba, an aromatic and medicinal plants industry is really in its infancy. However, interest is taking off and some innovative enterprises are underway.

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