Starting a Commercial Greenhouse Business In Alberta

Introduction

Success in the greenhouse business requires a well-defined market, a good location, significant capital dollars, a well-planned production system, people skills and experience in dealing with the "mechanical" necessities of the business. A successful business requires knowledge of plant management in terms of vegetative and generative actions, computerized controls and their use, good diagnostic skills and abilities to digest and use current information to increase productivity per unit area of the greenhouse.

Identify Your Market

Alberta greenhouse industry is the fourth largest in Canada and stands at 293 acres of covered area. Historically it has doubled in size since 1986 and it has been growing at a modest rate of between 4 and 7%.

From a marketing perspective it should be understood that in case of vegetables we are price takers, not price makers. We have to compete globally when we are supplying the wholesale markets. The nature of doing business with wholesalers is different than selling directly. Many growers do both wholesaling and retailing. Wholesale markets will demand consistency of product and quality and of course volumes.

That is why in Alberta two marketing groups are fairly successful. Red Hat Co-op is a group of about sixty growers in Redcliff and they market together. It means that growers are not marketers. It is a dedicated job of marketing managers. In central Alberta, Pik-N-Pak markets through Sunfresh Farms in Edmonton. By joining together the demands of wholesale marketing can be met and thus successful greenhouse businesses are developed. In case of bedding plants, there are a large number of diversified greenhouses and garden centers where customers come to your greenhouses. These greenhouses have the capability to change their price structure and also focus on quality and information.

In case of tree seedlings, one must secure contracts before constructing a greenhouse. Tree seedlings for reforestation are not grown on speculation. Specific knowledge of stock types, bud setting and hardening and post harvest handling is required. Most of the nursery plant growers have greenhouses for rooting and early plant handling.

Another part of the industry is perennials. During the past decade perennial market for landscaping has increased. Market for plugs has also increased significantly and many growers have specialized in this area.
To begin with you may wish to start small for direct marketing. If you want to grow for large-scale wholesale markets then it will be good idea to align yourselves with the existing channels.

One of the most asked questions is ”What can I grow to make money on?” The answer is that greenhouse is a farming business and it is mostly family run and in some cases family-investment run. The return on investment is not very large. It is estimated to be around 6 to 10%.

It is critical to take the time to develop your business plan. The business plan summarizes your business objectives and how you will attain them. Information on how to prepare your business plan is available on Roping the Web, AAFRD website www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agp4957?opendocument

Financial lenders will be looking for the type of information included in the business plan.

Greenhouse vegetables are either Cucumbers, Tomatoes, Sweet Peppers and/or Lettuce. In Alberta seedless cucumbers are grown in larger number when compared to tomatoes and this is opposite of Ontario and BC where tomatoes are grown in larger numbers. The production is geared towards the packers/wholesale market for distribution through the chain stores and fruit/vegetable markets. Alberta market for vegetables is primarily in the Prairies with some sales to Eastern Canada and U.S. Limited exports to U.S. occurs when there is an over supply of produce.

From marketing viewpoint, locally grown cucumbers are available from February to the end of November with imports in December and January from Mexico and Spain in December and January. Price for seedless cucumbers are highest in February and March, start declining in April to August and then recover. The price for seedless cucumbers has never been lower than field-grown cucumbers because of quality and freshness. Greenhouse tomatoes are available from the end of March to the middle of December and the price dips to its lowest in June, July and August and then recovers in September. During the past two years the price has been strongly influenced by production in Mexico, Florida and California. Just to understand the market place, look at what happened in 2004-2005 season. The price went as low as 7.00/15 pound case in July and August. With hurricanes in Florida and rain storms in California and some problems in Mexico, the price started increasing and by November it was over $50.00/15 pounds case. The challenge is in taking advantage of the information and planning our crops accordingly.

Peppers supply begins in April and remains steady till the end of November and price remains relatively stable through the year with a slight drop in summer.

Greenhouse flowers include cut flowers, potted plants and bedding plants. The production is either geared towards the wholesale market (chains, garden centres,
florists) or in the case of bedding plants may be direct to the consumer in what is called a retail grower situation.

**Location**

There are many factors to consider when selecting a site for your greenhouse business. Just because you already have a piece of land does not necessarily mean it will be a good location. Try to locate closer to your markets. Easy access to utilities will reduce your construction costs. Also remember county by laws and highway access may be a problem. Greenhouse vegetables are primarily grown in soilless grow systems so top quality soil is not essential. Organic production is practices in soil at this time.

**Natural Gas** - this is the most efficient of the fuel sources for heating your greenhouses. i.e. the cost per BTU is less than oil or propane and since heating may represent from 10-35% of your total production, it is a significant cost. You will also find less equipment maintenance problems with natural gas. Natural gas should be available at your location and normally you would pay for the cost of making the connection from the outside wall of the boiler room to the boilers/heaters. Coal is gaining some momentum as a source of fuel and Alberta coal is of good quality. Capital cost is higher but operating costs are much less than natural gas.

**Water** - a good supply of high quality water is critical to the success of the business. Have the water analyzed for a full range of criteria from a recognized laboratory. A specialist can help you to understand quality parameters. Basically the Total Salts, pH and bicarbonate levels along with some of the specific nutrient ions will determine its use. One quick fact to remember is that if sodium level is higher than 100 ppm then generally that water is not suitable for greenhouse irrigation. Hard water is suitable for irrigation. You should also determine your total water needs for summer and winter. In summer most of the vegetable crops require as high as 7-8 liters/sq.m of greenhouse area. Many growers recycle water so a system of collection, filtering and mixing should be in place. Sand filters and UV disinfection systems are getting more popular. Be aware of the fact that water can be contaminated with herbicides.

Hydro - 3 phase power is much more efficient than single phase both in the initial purchase of equipment (motors) and their operation.

An on-site generator will also be an "essential" piece of capital equipment to handle power interruptions of your hydro supply.

**Soil** - the type and drainage characteristics may be particularly important if you plan on growing the crop directly in the ground. Cut flower crops such as chrysanthemums and snapdragons require lighter, well-drained soils especially for winter production.

**Suppliers** - to your greenhouse business are important and in particular their closeness/accessibility when equipment fails or supplies are needed in a hurry. It is
difficult to have a successful greenhouse business in a "remote" area. As a production facility, the need for a constant supply of "inputs" is on going.

Customers - and the importance of being close to them whether you are in the wholesale or retail part of the business is important. Large wholesalers in Edmonton and Calgary find better communications with grower/suppliers who are close by.

For retail growers where the crop is being sold directly to the public a major cost of doing business is actually getting the customer to your greenhouses. The old adage, the 3 major factors to consider when setting up a retail greenhouse are "Location, Location and Location". Farmers Markets in Alberta are a major source of direct marketing and many growers take advantage of these opportunities. Some of the large growers may wholesale up to 70% of their crop and sell 30% through farmers markets. It is not only the vegetable growers who sell through these markets but bedding plant and flower growers also use these marketing channels. Customers enjoy freshness and personal touch. It is a direct connection between the grower and the customer.

One point to remember that in these Farmers Markets one has to grow their own product. This is a strict requirement. So one may find smaller areas in greenhouses devoted to the production of crops like lettuce or hot peppers, or egg plants.

Besides there are opportunities to sell directly to smaller specialty stores.

Capital

The greenhouse business is very capital intensive with the basic structure erected ranging in price from $6-$8 per sq. ft. depending on such major options as covering materials, ventilation systems, etc. Next we need to provide heating (both the source and distribution), irrigation (source and distribution), electric service (main connection and interior work), nutrient injection system for the irrigation water complete with pH and E.C. controllers, environmental computer to "run" the heating/cooling requirements with the option of adding humidity, CO2 and irrigation control. Now we need to build some type of support buildings for storage/shipping, staff room, office, etc. Add in some pesticide application equipment, concrete walkways, benching or a crop support system, high pressure lighting for the starting and/or finishing areas AND before long you have a total investment of $15-$25 per sq. ft.

Also to remember that vegetable growers need better greenhouse structures not just a plastic cold frame. The investment cost for vegetable greenhouses will be higher when compared to bedding plants growers.

Cut flowers growers have to invest in artificial lighting so their initial costs will be higher.
One of the realities of the greenhouse business is that the initial capital investment must make a return from operations because the re-sale value is only a fraction of the initial investment.

Production Systems/Economics

Vegetables

Greenhouse vegetables are usually grown in soilless media such as rockwool, coir (coconut fiber), pine and/or spruce sawdust and NFT (nutrient film technique) because there is better control of the total growing conditions compared to growing in the soil.

A one-acre size facility may be the starting point needed in order to have any economies for the required equipment (boilers, fertilizer, generator, service/packing building, etc).

Growing Greenhouse Vegetables

Seedless Cucumbers: Cucumbers are grown at a density of 1.25 to 1.50 plans/sq.m and the yields are reported in cucumbers/m2. Average yields in 2003 were around 110 cucumber/m2 while some growers reported yields as high as 130/m2. The potential yields could be as high as 150 cucumbers/m2 with the world highest yields reported to be close to 300 cucumbers/m2. Cucumber producers can grow, two or three crops per year because it is a relatively fast growing crop.

With the two-crop system, cucumbers are seeded in the middle of November and harvest begins in early February. Cloudy periods in late January can delay the harvest by one to two weeks. A second crop is seeded in June, planted in July with harvest beginning in early August. This crop continues until late November or early December.

In a three crop system, the spring crop is terminated in late May and a second crop is planted by the end of May or early June. Harvest continues until the middle of August. The third crop is planted by late August and harvest continues until late November or early December. A three-crop system generally produces better quality fruit although the production costs are higher.
In 2006 growers tried a system which is called “high wire” training system where fruit is developed and harvested from a single stem. It also allows for planting new crops while harvest is still continued from the older crop. This has allowed at least 20% higher production.

There is market for many different types of mini cucumbers. They come in the category of salad, pickling, gherkins and slicers. The production capacity is around 40-50 kg/sq.m per year on a 3-4 crops per year basis.

Coir (coconut fiber) is the most commonly used growing medium at this time and is used for one year. Cucumber seedlings are generally brought in from BC at 3 weeks stage at a price of around $1.75/seedling. There is an opportunity to grow these seedlings locally. At an estimate of 56 acres of cucumbers with 4,000 seedlings per acre, that is $392,000.00.

**Tomatoes:**

Tomato crops are seeded in the middle of November and planted by early January. Many growers bring in 35 days old seedlings from BC. The planting density is around 2.5 plants/m² and then in late March or early April every 4th plant is twin headed and that brings the plant density close to 3.2 plants/m². For summer climate an additional side shoots can also be allowed to develop which means more labor will be required to manage the crop. The harvest begins about 110 days from seeding and continues until late November.

The total marketable yields range between 50 to 60 kg/m² with a potential of up to 70 kg/m². From a cash flow point this
means that there is no income for 100 days. Only one crop is produced in a year.

Recently there is considerable interest in the production of cluster tomatoes. Unlike the beefsteak type of tomato, which is harvested as individual fruits, cluster tomatoes are harvested as a cluster of five to nine fruit attached together to a stem.

The entire cluster of uniform-sized fruit ripens more uniformly and has more flavors. More recently tomatoes are grown on raised troughs (see picture). This system offers the flexibility of harvesting without bending and also much better air movement around the plant and also better drainage.

Many growers are developing markets for yellow and orange tomatoes which are rich in Vitamin A and are sweeter in taste.

**Peppers:**

Pepper is a more difficult crop to grow. Production takes about 130 days from seed to harvest, the crop is seeded in the middle of October and harvest begins in the middle of March until November. Many growers will bring in 40 days old seedlings from B.C. Because of the time to produce a crop, growers have no income for five months. In addition, the greenhouse structure must have excellent environmental controls because peppers need precise day and night temperature to set flowers and fruit. This means
higher investments costs for the construction of a greenhouse to grow peppers. The planting density is between 3.3 to 3.5 plants/m² (6.5 to 7.1 stems/m²). It takes between 7 to 9 weeks from fruit set to fruit harvest. The yields range between 22 and 26 kg/m² with potential yields up to 30 kg/m².

Red-fruited varieties make up about 70% of the crop, followed by orange, yellow and purple varieties. All peppers turn green first and then change colors based on their genetics. The demand for hot peppers is slowly growing. At this time it is mostly grown for direct marketing although some is being sold through wholesale channels.

**Egg Plants:**

There is no large-scale commercial production of eggplants. Many growers will grow a few rows of eggplants for direct sales. The plant density is like tomatoes. The leaves are very attractive to whiteflies and thrips and biological controls work quite nicely on eggplants. Gradually production is going to increase because of interest from ethnic communities. Developing wholesale markets will take time and more research in plant management.

**Lettuce:**

Lettuce production is gradually increasing because of more interest in loose leaf and specialty lettuce. It is still not economical to grow crisp lettuce in a greenhouse. Hydroponic systems like NFT (nutrient film technique) or floating raft systems are gaining popularity for lettuce production. It takes about 3-4 weeks from seed to planting of a seedling and another 6-8 weeks to harvest. Crops are planted on a weekly basis. Up to 12 crops per year can be grown. Gross revenue potential for lettuce is around $8/sq.ft. The picture shows leaf lettuce being grown on a floating system where nutrients are supplied from fish waste. The research is being conducted at the Crop Diversification Centre South by Dr. Nick Savidov.

**Flowers**

Cut flowers—Some of the more common cut flowers such as roses and chrysanthemums are being cautiously planted now due to the ease of their importation from southern climates (equator countries). This import pressure has also served to lower average prices.

More difficult to import cut flowers such as gerbera, snapdragon, lily and lisianthus are being planted more often. The bulk of the cut flowers are sold through the traditional
retail flower shops and as such have not enjoyed big increases in sales. The "Cash and Carry" type of marketing by the large chain stores and independent fruit/vegetable markets is moving an increasing volume of cut flowers.

Yields and therefore revenues will fluctuate greatly but expected gross returns per sq. ft. will be in the $8-$12 range.

Potted flowers - can be classified as being on a weekly schedule such as chrysanthemums, violets, begonias, etc. or holidays such as poinsettia, Easter lily and hydrangea. For this type of crop, the cost of production can include the pot, media, plant material (cuttings, bulbs, etc.), growing time on the bench (usually calculated at $0.15 per sq. ft. per week) and shipping material (pot cover, box). Revenues are in the $12 per sq. ft. area but can be significantly higher depending on pot sizes and number of crops per year (i.e. turns on the bench).

The major market for potted plants is the chain store, which has taken over to a large extent from the traditional retail florist. Low mark ups, little/no service and strong competition are what has kept retail prices stagnant for potted crops.

**Bedding Plants** - The Spring production of bedding plants is quite often the starting point for people getting into the greenhouse business probably because of the strong demand for plant material and the relative ease of starting. Many will start with a small hoop-shaped Quonset greenhouse, unit heater, ventilation fan and some snow fence benching.

Growers can purchase flats already filled with media, plugs (small, singulated plants) from specialist propagators or buy already transplanted flats for their greenhouse. In short, you can be in business very quickly.

The bedding plant season usually will yield 1.5 turns for the floor space and about 25% additional with overhead hanging baskets. Gross returns are in the $8 per sq. ft. area. Average wholesale price per flat is $8 with direct costs being around $5.

Bedding plants are either sold direct (by retail growers) or to the chain store/garden centres. In Alberta retail sales continue well into July and August of potted material and hanging baskets. Planning should be done accordingly.
Alberta Agriculture, Food and Rural Development Publications

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/ipc5961?opendocument

4. Quality Bedding Plants Production, Scheduling and Marketing
5. Plant Nutrients and Fertilizer Management
6. Starting a Commercial Greenhouse Business

Ontario Ministry of Agriculture and Food Publications:

Pub. 370 Production Recommendations for Greenhouse Floriculture ($10.00 + GST). Contact the Publications Order Desk at 1-888-466-2372

A list of Agriculture and Agri-Food Canada’s publications is available by writing to:

Departmental Publication Service, Corporate Services Branch, Agriculture and Agri-Food Canada, Sir John Carling Building, 930 Carling Avenue, Ottawa, Ontario K1A 0C5
phone: (613) 759-6610/6626 or fax: (613) 759-6726. You can also visit their website at: http://www.omafra.gov.on.ca/scripts/english/external_links/external.asp?url=http://www.agr.gc.ca/index_e.phtml

There are a number of excellent magazines with a monthly publication that are subscribed to by many Ontario growers:

Greenhouse Canada-222 Argyle Ave., Delhi, Ont. N4B 2Y2

Canadian Florist Magazine-#1,1090 Aerowood Dr., Mississauga, L4W 1Y5

Grower Talks Magazine-P.O.Box 9, 335 N.River St., Batavia, Ill, USA, 60510-0009

Internet Sites:

AAFRD- www1.agric.gov.ab.ca On this homepage you can access to bimonthly newsletter, Greenhouse Business and other publications.

OMAF - http://www.gov.on.ca/OMAFRA/ has an expanding home page that includes staff, available media & leaf analysis labs, newsletters, upcoming conferences & meetings, etc.
The Ohio Florists Association has an excellent series of reference booklets as follows:

- Tips on Growing and Marketing Garden Mums
- Tips on Growing and Marketing Hanging Baskets
- Tips on the Use of Chemical Growth Regulators on Floriculture Crops
- Identification of Insects and Related Pests of Horticultural Plants-Pictorial Guide.
- Tips on Growing Zonal Geraniums, 2nd Edition
- Tips on Growing Poinsettias, 2nd Edition
- An Introduction to Greenhouse Production
- Ball Perennial Manual: Propagation and Production
- Grower Talks on Plugs 11
- Plant Basics, A Manual for the care of Indoor Plants

Note: there are more being added regularly.

Available from:
O.F.A. Services Inc.
2130 Stella Court, Suite 200
Columbus, Ohio
43215-1033 USA

The Grower Talks "Bookshelf" also has an excellent series of reference books available:

- Ball Pest & Disease Manual, 2nd Edition
- Plug & Transplant Production-A Grower's Guide
- Ball Perennial Manual
- Ball Red Book, 15th Edition
- Ball Field Guide to Diseases of Greenhouse Ornamentals
- Ball Culture Guide: The Encyclopedia of Seed Germination
- Bedding Plants IV-A Manual on the Culture of Bedding Plants as a Greenhouse Crop
- Diseases of Annuals and Perennials: A Ball Guide
- A Growers Guide to Water, Media and Nutrition for Greenhouse Crops
- Geraniums IV
- New Guinea Impatiens: A Ball Guide
- Grower Talks on Retailing

Note: there are more being added regularly
Conferences/Educational Meetings
There are three major Conferences that have a combination of speaker sessions and trade/exhibit areas that are designed specifically for the commercial greenhouse grower:

Green Industry Show and Conference, held in November in Edmonton – Check out www.greenindustryshow.com

Canadian Greenhouse Conference—held in October at the International Trade Centre, Missisauga, Ontario www.canadiangreenhouseconference.com

The Ohio International Short Course is held in early July at Columbus, Ohio

Grower Expo is held in early January at Chicago, Illinois.

NOTE: The above mentioned magazines, home pages, reference books and conferences is not a complete list but does represent the authors opinion of the major ones. There are a number of "specialty crop" meetings/reference books for a particular commodity that are also excellent.

Further Contact:

Dr. Mohyuddin Mirza, Greenhouse Industry Development Specialist, Crop Diversification Centre, North, 17507-Fort Road, Edmonton, Alberta, Canada, T5Y 6H3. Phone: 780-415-2303, Fax: 780-422-6096, email: mohyuddin.mirza@gov.ab.ca