AG-Ventures

Agriculture Business Profiles

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Commercial Greenhouse Vegetable Production

The purpose of this factsheet is to introduce greenhouse vegetable production as a potential business opportunity. The focus of this profile is on the key management issues associated with producing and marketing greenhouse vegetables in Alberta. This overview is not intended to be a substitute for individuals making their own thorough assessment of all the key factors that would influence the success of their individual operation.

1. Industry Highlights

- In Alberta, the greenhouse vegetable industry involves the production and marketing of tomatoes, cucumbers, peppers and lettuce crops. The 1999 estimates for greenhouse vegetable production were:

Table No. 1 The Greenhouse Vegetable Industry of Canada (1999)

	Total Number of Greenhouses	Area (m^2)	Glass (m^2)	Plastic (m^2)	Total Greenhouse Sales
Ontario	1,355	7,455,280	2,068,950	5,386,330	$765,072,217
Quebec	875	2,257,543	222,503	2,035,040	$152,084,000
B.C.	650	3,469,927	1,916,124	1,553,803	$349,003,000
Alberta	325	686,089	70,049	616,040	$64,845,000
Canada	3,810	14,695,489	4,393,383	10,302,014	$1,449,812,617

Source: Statistics Canada

- Cucumbers and tomatoes are the two most popular crops grown by Alberta greenhouse vegetable growers. An overview of 1999 greenhouse production in Alberta is given in Table No. 2.

Table No. 2 1999 Alberta Greenhouse Vegetable Production

	Tomatoes	Cucumbers	Peppers	Total
Production	1,775,361 kg	1,317,000 doz.	600,103 kg	
Value of production	$3,950,000	$10,009,000	$1,955,000	$16,217,000

Source: Statistics Canada

- The greenhouse vegetables grown in Alberta are primarily for domestic consumption. In 1996, an estimated 15 per cent of the greenhouse cucumber crop was exported to the United States. Gaining access to retail consumers is the critical marketing issue for greenhouse vegetable producers.
- Growers market their crops through wholesalers, marketing co-operatives or farmers' markets. The *Alberta Horticultural Industry Survey* report shows that the following marketing methods were used by a group of 82 greenhouse vegetable growers.[1]

1 Alberta Horticulture Industry Survey Report; Council of Alberta Horticultural Industries, December 1994, pg. 6.13.

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Table No. 3 Marketing Methods Used by Greenhouse Vegetable Growers

Based on a Percentage of Gross Sales	
Direct to retailers/wholesalers	48%
Farmers' Markets	2%
To other growers	3%
To grower co-operatives	47%

- Individuals who are thinking about establishing a greenhouse vegetable enterprise need to determine which marketing methods will provide the best fit for their operation. New entrants to the greenhouse vegetable industry also need to carefully assess the markets for each vegetable crop they might produce in order to determine if there is room for more production.
- Marketing greenhouse vegetables requires time for researching potential customers and different products, selecting target markets, and developing marketing strategies to gain exposure to and acceptance from consumers.
- An industry survey conducted in 1998 by Alberta Agriculture, Food and Rural Development provides the following estimates for operating costs and revenues.

Table No. 4 Greenhouse Vegetable Production Operating Revenues and Expenses

	Cucumber Production $ per square foot	Tomato Production $ per square foot
Average gross revenues	$7.40	$8.38
Average operating costs	$4.74	$6.66
Depreciation costs	$0.45	$0.48
Operator's labour	$0.67	$0.55
Interest on investment	$0.70	$0.33
Average production costs	$6.55	$8.02

- Since 1998, an increase in the price of natural gas has had a significant impact on operating costs for all greenhouse crops. Although government assistance programs have helped to reduce costs, many growers are investigating ways of further reducing their costs by using other heating fuels and enhancing their energy conservation practices.
- The economic returns in the Alberta greenhouse vegetable industry have only provided a modest return to equity capital and the labour contributed by owners. As a result, greenhouse operators tend to be family-owned businesses rather than corporate businesses which require higher levels of returns on capital and management.
- The basic requirements for entering the greenhouse vegetable industry are:
  - a site that offers access to markets, labour, good quality water, utilities and room for future expansion
  - a high level of production management and the ability to apply intensive management skills to the crops
  - the ability to assess market potential
  - financial resources to invest in the development and operation of the business
  - the ability to juggle several activities at once
  - the ability to manage labour
  - the ability to keep control of the financial affairs of the business as well as the production operations

2. Regulatory Basics

- Individuals who are thinking about building a commercial greenhouse should investigate the municipal requirements. In some jurisdictions, the construction of a greenhouse is subject to an environmental impact review.
- Greenhouses are subject to zoning regulations that control the use of land. Local zoning regulations determine the zones in which greenhouses can be established and the building codes for a greenhouse.
- The roadside sale of vegetables within a town or city will likely to require the seller to have a peddler's license. Vendors at a farmers' market will have to abide by the rules of the market.
- Access to an adequate supply of good quality water is necessary when developing a commercial greenhouse operation. Depending on the size of the proposed operation and the water source, an irrigation license may be required. Individuals considering developing a greenhouse operation should contact an irrigation specialist with Alberta Agriculture, Food and Rural Development.
- The marketing of greenhouse tomatoes and cucumbers in Canada is regulated under the *Canada Agricultural Products Act*. The Act provides for national standards and grades. Tomatoes and cucumbers that are sold to wholesalers must also adhere to these regulations. More information about this act can be found on the Department of Justice Canada website at http://laws.justice.gc.ca/en/C-0.4/index.html

3. Market Basics

- Market research should be conducted before any production activities are started. Since there are only three major greenhouse vegetable crops (cucumbers, tomatoes and peppers), research should focus on the different markets for these crops and how to access them.
- New producers must pay particular attention to evidence of excess supply in a particular market and trends of declining consumption or prices.
- Specific questions to ask when conducting market research for greenhouse vegetables are:[2]
  - What products do consumers buy?
  - Who buys the product(s)?
  - Where are the buyers located?
  - What is the market size?
  - What, when and where do the buyers buy?
  - What are the packaging requirements of each market?
  - What are the market prices?
  - How much do prices fluctuate?
  - Is the market mature or growing?
  - Does the market have room for additional production?
- Locally grown tomatoes, cucumbers and peppers have to compete with imported greenhouse vegetables. Most of these are from British Columbia and are field grown vegetables. Prices are influenced by the availability of these competing crops.
- Established producers of long English cucumbers have developed markets for their crops. Most of this crop, which is grown in the Medicine Hat, Redcliff and Red Deer areas, is marketed collectively. A small number of producers market directly to retailers, but most of the direct sales occur at farmers' markets. Because of the number of established producers, the local market for greenhouse cucumbers is almost saturated.
- Greenhouse tomatoes must compete with field grown and imported tomatoes. As a result, prices fluctuate during the year.
- The primary lettuce market in Alberta is for crisp lettuce. Unfortunately, production limitations have prevented Alberta greenhouse growers from being able to economically produce crops suitable for this market. Loose leaf lettuce, romaine and butterhead lettuce have fewer production constraints, but market prices are not always sufficient to cover the cost of production.
- Greenhouse peppers are a newer crop for Alberta greenhouse growers. Producers who move into pepper production have to compete with British Columbia producers who currently supply much of the Alberta retail market.
- Greenhouse vegetables are a perishable crop. As a result, growers must have a marketing strategy that ensures their produce has timely access to the retail markets. The majority of greenhouse vegetables are marketed to consumers through retailers. The retail market is accessed primarily through wholesalers. In fact, all the large retailers deal only with wholesale buyers.
- Smaller retailers and some restaurants may be willing to purchase produce from local growers on the basis that it is locally grown. However, most restaurants also buy their produce from a wholesaler. Growers hoping to access the retail or foodservice market through wholesalers must be able to prove their ability to provide a quality product on a reliable basis at a competitive price.
- Generally, new growers have to be in the business for a few years before wholesale buyers show an interest in developing a business relationship. Producers who are seeking to market to wholesalers must be prepared to:
  - make business calls with wholesale buyers in order to develop and maintain markets for their produce
  - assess new trends in order to respond to changing consumer tastes and preferences
  - sort, grade and package the product as required by each wholesaler
- A small amount of produce is marketed directly to consumers either from retail outlets that are part of the greenhouse facility or through farmers' markets. Marketing greenhouse vegetables through retail outlets located at the greenhouse is a relatively small market for greenhouse growers in Alberta.
- Farmers' markets consist of a number of producers selling their products directly to consumers at a common location. Each grower has a separate stall or stand at the market. There are farmers' markets located throughout Alberta[3].

2 Marketing Non-traditional, exotic(niche) crops, Farm Facts, Saskatchewan Agriculture and Food.

3 A publication listing the locations of Farmers' Markets is available through the offices of Alberta Agriculture, Food and Rural Development or on the department's website www.agric.gov.ab.ca/store/farmersmarket/index.html

- The advantages of farmers' markets are:
  - individual growers benefit from collective advertising that attracts more people to the market location
  - there is an opportunity for new growers to gain exposure with consumers
  - they provide a means for growers to market surplus produce
  - the availability of services such as parking and promotion
  - access to consumers across the province, depending on how many markets a producer wishes to sell at
- The disadvantages of farmers' markets are:
  - the producer must harvest, package and transport their produce to the market
  - growers must be prepared for competition with other vendors for sales
  - growers must be prepared to have unsold produce that needs to be returned to the greenhouse facility
- Some pointers for marketing at farmers' markets are:
  - keep the same stall location to establish a market presence
  - sell only high quality products
  - work to establish a reputation as a grower of high quality produce
- The critical marketing activity for the manager of a greenhouse vegetable enterprise is to gain access to the retail consumers. Therefore, growers must be prepared to research the various markets in order to determine which crop(s) to grow and which markets to target.

4. Production Basics

- New entrants to greenhouse vegetable production must be prepared to study both existing operations and published material to gain information to help them establish their enterprise and develop a production process. Growers also need to do their own on-site research to determine the growing techniques that give them the best results.
- Greenhouse vegetable production methods are best learned by working with an experienced greenhouse operator. Only through this type of hands-on experience can new entrants gain the skills required to manage nutrient levels, insects and diseases, and the greenhouse environment.
- The following are the key resource requirements for a greenhouse vegetable operation:
  - **Site location** – The following factors should be considered in the site selection for a greenhouse enterprise.
    - proximity to markets
    - slope of the land and exposure to the sun
    - access to adequate amounts of good quality water
    - access to utilities
    - access to a main transportation corridor
    - access to labour
    - room for future expansion
    - zoning requirements or limitations
    - potential environmental hazards such as, industrial pollution and contaminated water
  - **Water Quantity** – Factors such as the crops being produced, area to be watered, light intensity, growing medium and time of year all influence the water requirements of a greenhouse operation. A typical greenhouse operation requires 800 cubic metres of water per 100 square metres of growing space per year. The irrigation system and pump need to be designed to deliver adequate water to individual plants during peak consumptive periods.
  - **Water Quality** – Water with high levels of soluble salts is considered to be of poor quality for greenhouse vegetable crops. Electrical conductivity (EC) and the sodium absorption ration (SAR) are used to measure the quality of water. Water with a SAR of four or less and an EC of 0.8 is considered to be good quality water. If the SAR is greater than four and EC greater than 0.8, special management practices are required.
  - **Facilities** – Developing a greenhouse facility is a major step that affects both the production efficiency and economic well being of the business for a long time. Producers making this step must be prepared to do considerable research to determine the most appropriate facility for their situation.

- The greenhouse facility must provide an ideal environment for production and a layout that allows for the efficient use of labour and equipment in the handling of crops. When developing a new greenhouse facility producers need to consider the following issues:
  - size of the greenhouse
  - orientation of the greenhouse
  - greenhouse design
  - type of glazing material
  - heating requirements and heating system
  - cooling and ventilation requirements
  - space requirements for storage, work area and production area
  - production equipment
  - water system
- New entrants to the industry should seek assistance from greenhouse specialists with Alberta Agriculture, Food and Rural Development to assess the resource requirements for their proposed operation.
- ***The critical production management issues*** are:
  - **Crops** – The decision as to which crops to grow will be based on market research and production capabilities. The grower also needs to determine how and when to produce, as well as what varieties are most suitable.
  - **Production process** – Producers must consider the production resources available to them and how these resources can be used to produce the crops. The facilities, site, labour, equipment resources and potential markets will determine the nature of the production process used by the producer. New entrants, with limited resources, are likely to have production processes that are basic in nature. Established operations have more intensive production processes that use modern technology and equipment, but require larger developed markets.
  - **Scheduling** – The particular crop and levels of light intensity and duration determine the scheduling of crops. Long English cucumbers require 60 days from seeding to first harvest during the winter months and 45 days during the summer. 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 mid November and harvest begins in early February. A second crop is seeded in June, planted in July and harvested in early August.
    - 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 in early June. The harvest continues until the middle of August. The third crop is planted by late August and the harvest continues until late November or early December.
    - Tomatoes need 100 to 110 days from seeding to harvest. The crop is seeded in the middle of November and planted by early January. Harvesting begins by early March and continues until late November. Only one crop is produced each year.
    - Sweet peppers take about 140 days from seed to harvest. The crop is seeded in the middle of October and transplanted in mid December. Harvesting begins in late March and continues until November.
  - **Environmental controls** – Controlling a crop's environment to target optimum plant growth accounts for about 90 per cent of the yield. Growers need to manage the key environmental factors in a timely and economic manner to achieve maximum yields and reduce plant stress. Key factors are temperature, light, carbon dioxide, relative humidity and vapour pressure deficit. Most greenhouse operators rely on controlling these factors with the aid of a computer.
  - **Growth media** – Greenhouse vegetables can be grown in soil or hydroponically. Hydroponic production refers to the use of growing media other than soil. It is not economical to produce greenhouse vegetables in soil due to the build up of soil borne diseases and insects that require the soil to be replaced or pasteurized.
    - Soilless media are well-drained, uniform, disease free and have good moisture-air holding capacities. They provide for more efficient use of water and fertilizer. Media that are used in hydroponic systems include rockwool and sawdust. Nearly all commercial vegetable growers use a hydroponic system.
    - Growers need to weigh these advantages with the higher capital cost required to

establish a hydroponic production system.

- **Propagation** – Greenhouse vegetables are grown from seed and then transplanted to the main growing area of the greenhouse. Transplants help to ensure uniform crop establishment. Seeds are sown into rockwool plugs or blocks. Each crop has specific requirements to ensure germination. Growers need to be familiar with the germination requirements of the crops selected for their operations.
- **Crop nutrition** – Growers should know the nutritional requirements of the crop and be prepared to monitor them on a regular basis. Fertilizer management is a critical element in greenhouse vegetable production. The stage of crop growth, fertilizer formulation and concentration, climate control and disease control practices must be taken into account when developing a fertilizer program. The fertilizer is generally delivered through the irrigation system. Growers should ensure that they have appropriate storage tanks to hold and deliver the nutrient solution.
- **Irrigation** – Growers need to determine the best method of providing uniform delivery of the water and fertilizer solution to each plant. Most commercial growers use a drip irrigation system. Computers, time clocks or programmable irrigation monitors are used to ensure regular applications at the frequencies necessary for maximum production.
- **Carbon dioxide enrichment** – Carbon dioxide is necessary for plant growth. An actively growing crop can quickly deplete a greenhouse of carbon dioxide, thereby limiting crop yields. To maximize crop production, it is necessary to supplement the carbon dioxide levels in the greenhouse. There are several different ways to supplement the levels. Producers need to research which method is best for their operation.
- **Pollination** – Pollination of flowers is necessary to produce greenhouse tomatoes and sweet peppers. Pollination can be done by electric vibrators, bumblebees or air blasts. Growers need to determine which method is most practical and effective for their operation.
- **Disease control** –Good disease management is crucial in the production of greenhouse vegetables. Disease control is achieved through crop monitoring and cultural, chemical, physical and biological control strategies. Growers need to utilize all of these methods to ensure a productive operation.
- **Insect control** – Pest control is necessary to prevent damage to the seedlings and producing plants. Growers must be familiar with potential insect and mite problems and appropriate management practices. Biological control methods are widely practiced by commercial growers, especially if they are using bumblebees for pollination.
- **Harvest management** – Vegetable crops must be harvested at the appropriate stage of growth or maturity in order to maximize their shelf life. As well, greenhouse vegetables need to be cooled after harvest to remove field heat and extend their shelf life. Cucumbers, tomatoes and peppers require frequent multiple harvests in order to supply a uniform product with optimal quality.
- **On-farm food safety** – There is a growing concern among consumers about the safety of their food. To reassure consumers and wholesale buyers, the Canadian Horticultural Council has developed on-farm food safety guidelines for fresh fruits and vegetables. These guidelines outline the good agricultural practices that growers should be using in their operations. Although the program is a voluntary one, an increasing number of wholesale buyers are insisting that growers are producing in accordance with the guidelines. Priced copies of these guidelines are available from Alberta Agriculture, Food and Rural Development's Food Safety Division.

- *The critical production management issues* for producers are:
  - a need to balance production and marketing issues in production decisions
  - a need to develop an effective production process and to monitor and adjust the process on a regular basis
  - a need to continually seek out research information and production practices that contribute to improved yields and quality

5. Economic/Finance Basics

- Greenhouse vegetable growers are continually challenged to produce products that meet consumer needs, achieve a good market price and control production costs.
- Individual managers must be prepared to keep accurate records of their production costs to help develop price strategies for their products and monitor the profitability of the greenhouse enterprise.

- Growers must be prepared to research the prices, costs and operating requirements of various types of greenhouse operations. As well, growers must be prepared to estimate the costs and returns for the specific operation they are considering putting into place.
- The following economic information focuses on the production costs and economic returns of greenhouse tomato and cucumber production. These figures are provided to give growers an overview of the costs and returns of a greenhouse vegetable enterprise.
- These budgets are intended to provide producers with a framework to identify the type of information and the types of analysis required to assess the viability of their proposed operation. The production costs for individual enterprises will vary due to size, location, crops, machinery, labour use and marketing activities.

Table No. 5 Capital Investment Requirement for Greenhouse Pepper Production, 2000

Building	(sq. ft.)	58,560
Land area	(acres)	3.50
Land value	($)	5,075
Building equipment	($)	706,092
Automotive	($)	31,500
Total investment	($)	742,667
Investment/sq. ft.	($)	12.68

Table No. 6 Production Costs and Returns for Greenhouse Peppers, 2000

Greenhouse Production Area – 58,560 sq. ft.

		Total ($)	$/Sq.Ft.
A. Gross Revenue		**535,824**	**9.15**
Operating Costs			
Growing media, seeds/cuttings		41,577.60	0.71
Fertilizer & chemicals		18,153.60	0.31
Greenhouse fuel		79,641.60	1.36
Power, water & telephone		18,868.03	0.34
Greenhouse insurance		7,612.80	0.13
Building & machinery repairs		6,441.60	0.11
Auto fuel, insurance, registration, repairs		15,225.60	0.26
Property & business taxes		1,171.20	0.02
Accounting, legal fees, office supplies		3,513.60	0.06
Travel, advertizing & soil testing		2,342.40	0.40
Membership, donations & subscriptions		5,270.40	0.09
Marketing costs & freight		40,406.40	0.69
Hired labour, insurance & benefits		116,534.40	1.99
Interest on operating loan		1,756.80	0.03
Miscellaneous costs		7,613.00	0.13
B. Total Operating Costs		**336,128.83**	**6.27**
Investment Costs			
Operator's labour		38,064	0.65
Interest costs		60,902	1.04
Depreciation		37,049	0.63
C. Total Investment		**136,015**	**2.32**
D. Total Production Costs	**(B + C)**	**502,144**	**8.58**
Return Over Operating Costs	**(A - B)**	**169,695**	**2.90**
Return to Management	**(A - D)**	**33,680**	**0.57**

Table No. 7 Capital Investment Requirement for Greenhouse Cucumber Production, 2000

Building	(sq. ft.)	49,520
Land area	(acres)	3
Land value	($)	4,350
Building equipment	($)	539,414
Automotive	($)	28,125
Total investment	($)	571,889
Investment/sq. ft.	($)	11.55

Table No. 8 Production Costs and Returns for Greenhouse Cucumbers, 2000

Greenhouse Production Area – 49,520 sq. ft.

		Total ($)	$/Sq.Ft.
A. Gross Revenue		**354,068**	**7.15**
Operating Costs			
Growing media, seeds/cuttings		29,440.59	0.59
Fertilizer & chemicals		14,772.40	0.30
Greenhouse fuel		57,304.60	1.16
Power, water & telephone		15,351.20	0.31
Greenhouse insurance		6,437.60	0.13
Building & machinery repairs		5,447.20	0.11
Auto fuel, insurance, registration, repairs		9,904.00	0.20
Property & business taxes		3,466.40	0.07
Accounting, legal fees, office supplies		2,476.00	0.05
Travel, advertizing & soil testing		990.40	0.02
Membership, donations & subscriptions		3,961.60	0.08
Marketing costs & freight		43,082.40	0.87
Hired labour, insurance & benefits		75,012.14	1.51
Interest on operating loan		10,894.40	0.22
Miscellaneous costs		5,942.40	0.12
B. Total Operating Costs		**284,483.33**	**5.75**
Investment Costs			
Operator's labour		39,469.50	0.80
Interest costs		34,664.00	0.70
Depreciation		28,709.75	0.58
C. Total Investment		**102,843.25**	**2.08**
D. Total Production Costs	**(B + C)**	**387,326.58**	**7.82**
Return Over Operating Costs	**(A - B)**	**69,584.67**	**1.40**
Return to Management	**(A - D)**	**33,258.58**	**0.67**

Table No. 9 Capital Investment Requirement for Greenhouse Tomato Production, 2000

Building	(sq. ft.)	58,700
Land area	(acres)	3
Land value	($)	4,350
Building equipment	($)	635,377
Automotive	25,875	
Total investment	($)	665,602
Investment/sq. ft.	($)	11.34

Table No. 10 Production Costs and Returns for Greenhouse Tomatoes, 2000

Greenhouse Production Area – 56,980 sq. ft.

		Total ($)	$/Sq.Ft.
A. Gross Revenue		**471,225**	**8.27**
Operating Costs			
Growing media, seeds/cuttings		19,943.00	0.35
Fertilizer & chemicals		30,199.40	0.53
Greenhouse fuel		76,923.00	1.35
Power, water & telephone		23,361.00	0.41
Greenhouse insurance		9,686.60	0.17
Building & machinery repairs		15,384.60	0.27
Auto fuel, insurance, registration, repairs		11,395.40	0.20
Property & business taxes		5,128.20	0.09
Accounting, legal fees, office supplies		3,418.80	0.06
Travel, advertizing & soil testing		1,139.60	0.02
Membership, donations & subscriptions		1,384.61	0.02
Marketing costs & freight		80,341.80	1.41
Hired labour, insurance & benefits		114,529.80	2.01
Interest on operating loan		569.80	0.01
Miscellaneous costs		13,105.40	0.18
B. Total Operating Costs		**406,512.41**	**7.13**
Investment Costs			
Operator's labour		34,188.00	0.60
Interest costs		18,803.40	0.33
Depreciation		35,542.55	0.61
C. Total Investment		**87,533.95**	**1.54**
D. Total Production Costs	**(B + C)**	**494,046.36**	**8.67**
Return Over Operating Costs	**(A - B)**	**64,712.19**	**1.14**
Return to Management	**(A - D)**	**22,821.36**	**0.40**

- The returns to management are the funds available after all operating costs, opportunity cost on investment and operator labour and depreciation have been paid. Interest on capital was included calculated at 10 per cent while operator labour was based on actual hours at $10.50 per hour for the owner and $7.50 per hour for family members. Family run greenhouses stay viable since after covering operating and depreciation expenses, they are prepared to accept lower rates of return on their capital and labour contributions.
- *The critical economic issue* for greenhouse vegetable growers is to be able to achieve all of the factors necessary for their enterprise to be profitable. These factors include:
  - gaining access to consumers
  - achieving a market price for the product that is competitive and profitable
  - undertaking the production, harvest and marketing activities at a cost that can be covered by revenues

6. Resources

The following resources are available to individuals seeking to take a more detailed look at the greenhouse vegetable industry.

Industry Associations

Alberta Greenhouse Growers Association
c/o Olds College
Land Sciences Building
4500 - 50 Street
Olds, Alberta T4H 1R6

Publications

A Cost Analysis of Greenhouse Cucumber and Tomato Production, Agdex 821-66

Getting Started in the Greenhouse Business by Dr. M Mirza

These publications are available through both of Alberta Agriculture, Food and Rural Development's Crop Diversification Centres.

Production and Marketing

Dr. Mohyuddin Mirza
Greenhouse Crops Specialist
Crop Diversification Centre North
Edmonton, Alberta T5B 4K3
Phone: (780) 422-1789

Greenhouse Crops Specialist
Crop Diversification Centre South
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Phone: (780) 422-1789

Economics

Farm Management Specialists; contact your local district office.

Business Planning

Rural Development Specialists – Business; contact your local district office.

Websites

Alberta Vegetable Variety Recommendations for Market Gardeners for 2001
http://www.agric.gov.ab.ca/crops/hort/veg_recommendations.html

Cabbage Seedpod Weevil
http://www.agric.gov.ab.ca/agdex/600/622-21.html

Fresh Vegetable Market Gardening Industry
http://www.agric.gov.ab.ca/agdex/200/5083001.html

Guide to Commercial Greenhouse Sweet Bell Pepper Production in Alberta
http://www.agric.gov.ab.ca/crops/peppers/index.html

Potato Production Guide
http://www.agric.gov.ab.ca/agdex/potato/index.html

Production of Small Potatoes for the Fresh Market
http://www.agric.gov.ab.ca/crops/hort/potato/gourmet.html

Soil Temperature for Germination
http://www.agric.gov.ab.ca/agdex/500/590-1.html

Understanding Bacterial Ring Rot in Potatoes
http://www.agric.gov.ab.ca/agdex/200/258_635-5.html

7. Key Management Issues

- If you continue to investigate this agricultural business opportunity, it is essential that you are able to answer the following questions concerning the production and marketing of greenhouse vegetables.
  - Have you clearly defined the products you will be marketing and the target market that you will be marketing to?
  - Have you determined how you will access your market?
  - Have you clearly defined the production process and the production resources that you will require to produce for the specific market(s) mentioned above?
  - Have you clearly defined the marketing activities required in order to market your product to the specific market segment mentioned above?
  - Are you aware of the intensive management required by the production activities of a greenhouse vegetable operation?
  - Are you aware of the amount of time you need to devote to continuously researching your markets and to adjusting your production activities to best meet the needs of customers?
  - Are you aware of the key performance factors and the level of performance you need to achieve for each, in order for your business to be economically viable?
  - Have you objectively and thoroughly compared the marketing, production, economic and management requirements of a vegetable enterprise together with the resources, skills and abilities that you have available?

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