

The Greenhouse Business

GREENHOUSE INDUSTRY REPORT


Mohyuddin Mirza

It appears that market demand for locally grown cucumbers, tomatoes and peppers continues to be growing. With more awareness by consumers on the advantages of locally grown produce, and with more articles in the press, there is a demand for locally grown greenhouse vegetables. Our problem is the same that we are not getting a better price from commercial wholesale channels. Our price is still determined by Mexico, USA and The Netherlands. I was very surprised to see that greenhouse grown peppers air flown from The Netherlands were being offered at between \$14.25 to \$16.50/5 Kg case. According to 2008 cost of production figures variable costs of production for greenhouse peppers was \$19.02/5Kg box and \$2.53 for capital costs. This means total production costs were \$21.56/5kg box. I think it is a clear case of dumping and our industry is going to suffer economic losses. The question is how our growers could stay competitive in a global context when large scale producers offer such prices?

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The Greenhouse Industry Show & Conference

November 19 & 20, 2009

Shaw Conference Centre

9797 Jasper Ave.

Edmonton, Alberta

GREENHOUSE INDUSTRY REPORT (CONT'D)

Mohyuddin Mirza

The vegetable industry is still expanding and consolidating. During a visit to Redcliff-Medicine Hat area I found about 4 acres of greenhouse under construction. This is going to be glass as a cover material. It is an interesting change in the construction material. I remember in the 1980's there was all glass in the area and then hail storms forced the growers to switch over to the use of plastic materials. Now it appears that due to more interest in winter production, maximum light availability is a big consideration. Ontario started into more glass greenhouses and now I think this is the first one in Alberta. There is no doubt that in summer, growers have to adjust to high light conditions and may have to re-learn the irrigation and crop management practices. Other expansions are being discussed by some growers. The market is there, it is the question of putting it all together.

Bedding plants season was reasonably good. Growers I talked to mentioned that they recovered their costs in June. Weather was not very good in May. Some growers in the Edmonton area with retail facilities are still busy with hanging baskets and garden centres.

With natural gas prices staying low for the time being, I think growers should discuss strategies when prices go up. They should consider investing in alternative fuels where feasible. Production per unit area of the greenhouse has to go up consistently. This means better understanding of environmental controls, choice of better varieties and whole areas of plant management. I think the next two years will be challenging for the industry and I know growers are ready to compete in this global market.

Farming Solar Energy

Rising energy costs as well as concerns about carbon emissions and air quality are enhancing interest in solar energy. In Europe, Asia and now Ontario, governments are providing incentives to encourage the use of solar energy to provide cleaner and more environmentally sustainable sources of electricity. West Carleton, Ontario will be home to one of North America's largest solar energy installations. A 200 acre farm located just west of Ottawa is about to undergo a \$100-million investment by installing 231,000 solar units capable of 23.4 megawatts of power. That's enough clean energy to serve an average of 7,000 homes when the province's power demand is highest. It will be Canada's largest photovoltaic plant that converts sunlight directly into electricity. The firm behind the project is EdF-EN Canada - the Canadian arm of the French-based renewable energy firm EdF-Energie Nouvelles. The solar power project is being developed as two installations under Government of Ontario's proposed *Green Energy and Green Economy Act* which promotes moving away from the use of coal-fuelled energy plants by 2014 and moving towards biomass, biogas, solar and wind energy instead. The industry is getting a lot of government support. For example, consumers pay five to six cents per kilowatt hour for conventional electricity, but the government is paying solar companies 42 cents



(cont.d pg. 12)

IS IT A YEAR OF PLANT DISEASES?

Mohyuddin Mirza

During my recent travels I noticed that many diseases are around on vegetable plants. Nothing new but it appears that old diseases appear with new dimensions. I remember when I started my job in 1977 and did a survey of greenhouse vegetable diseases and many diseases were identified. For example, in the case of cucumbers which used to be our major crop, pythium root rot was the major issue along with nematodes and that forced us to move to hydroponics cultivation systems. There were diseases like gummy stem blight, bacterial leaf spot, grey mold *Botrytis*, white mold *Sclerotinia* and *Fusarium* stem rot. Now I find that gummy stem blight is more common on mini cucumbers compared to regular cucumbers. I am going to describe the major diseases in cucumbers, tomatoes and peppers I have seen during this season.

Gummy Stem Blight (GSB) of Cucumbers

Mohyuddin Mirza



The pictures show symptoms on stem and fruit. GSB is caused by a fungus *Didymella bryoniae*. Sometimes the disease can be confused with black rot caused by *Phomopsis cucurbitae* and *Botrytis*. *Botrytis* is easy to distinguish because growers have experience with this disease. *Botrytis* becomes grey and fluffy under high humidity. The picture on the right shows a mini cucumber cut up to show necrosis and browning in the middle. On the surface the blossom end may show yellowing and some browning.

IS IT A YEAR OF PLANT DISEASES (CONT.'D)?

Symptoms: GSB can occur on all parts of the cucumber plant and all phases of growth. Mini cucumbers appear to be more susceptible to GSB compared to regular cucumbers. It first appears as brown-grey lesions on the tips of soft growing leaf points and young developing tendrils. Growers may be more familiar with lesions on the base of the stem with characteristics amber-red gummy exudates. On stem tissue where pruning wounds from laterals or leaves originate, the disease produces both exudates and also dark, pin-head size structures as seen in the picture on the left. In the early stages these lesions may appear to be on the surface but eventually the infections move inside and leads to girdling and eventually the plant dies.

Infected flowers may develop into fruit which is shrivelled at the blossom end with traces of internal, brown rotting tissue. Fruit may also appear normal at harvest but develop an internal, post harvest rot later.

On leaves, the symptoms are shown as in this picture. The lesions are V-shaped and appear as yellow-brown. Infection starts from the edge of the leaf and moves inwards.

Some facts about the fungus:



- The disease is spread by air borne spores which are released between 18:00 to 21:00 hours. These spores may remain dormant until moisture is available.
- A second method of spread is by splashing water droplets including high-volume spray or by transfer from pruning knives or hands.
- Spores need only a few hours of moisture to germinate and establish infections. It has been shown that a wet surface or moist wound site for at least one hour will enhance disease establishment and development.
- Spores can infect flowers and pruning wounds. Spores which land on very young flowers cause the fungus to grow inside the fruit as it develops.
- The fungus develops rapidly at high relative humidity, low light and temperatures between 20 to 28C.

What are control strategies?

Cultural:

- The most important cultural control strategy is to manage relative humidity not only in the greenhouse air but in the canopy, at the base of the plant and around the plants. Air movement is restricted due to plant density. Find ways to get rid of moisture laden air and bring dry air in from the outside. More greenhouses depend on natural convection for air movement so they should focus on pipe temperatures to move the air around the base of the plant and in the canopy.

IS IT A YEAR OF PLANT DISEASES (CONT.'D)?

- Avoid sudden changes in climate, especially relative humidity. Look at your computer screens which show graphs of relative humidity over a 24 hour period. If you are using very sharp pre-night dipping regimes, that is temperature drops from day setting to night setting in just one hour, then dew point can be reached. Here is information on critical temperatures, relative humidity and dew points. It may help in proper decision making.

Air Temperature	Relative Humidity	Dew point Temperature
18C	80%	14C
18C	90%	16C
22C	80%	18C
22C	90%	20C

If you look at this table and you are planning to pre-night dip from 22C to 18C, that is from day temperature setting to night setting, then at 90% relative humidity, dew point will be reached at 20C. That will cause condensation on plant parts especially the leaves and young parts of plants. So plan pre-night dipping based on existing relative humidity and dew point temperature consideration. Similarly when raising the temperature from night to day settings, then it is done slowly at 1C per hour and ensure that leaf temperatures are at day time targets before sunrise.

- If you are using Moisture Deficit (MD) as a measurement for environmental control, then try to maintain a minimum of 3 grams/m3.
- Managing night time relative humidity is also important. Vent if necessary to reduce the humidity.
- Avoid spraying insecticides or foliar feeding up to 3-4 hours before sunset. It means that foliage should dry out before sunset.
- Make sure that pruning practices are proper.
- If you look at the picture on the next page you can see leaf stubs hanging onto the stem and many of them are turning yellow. Such stubs are easily accessible to fungus spores and infection can enter the main stem. Growers' argument is that it is a labor saving strategy just to remove the main leaf. The recommended practice to "clean" break the leaves that are flush to the stem with no "stubs" remaining. I can see the point if you can manage the relative humidity and air movement is good and those stubs dry out within a couple of days. If GSB is an issue then this type of pruning should be examined in the context of cost and benefits.

IS IT A YEAR OF PLANT DISEASES (CONT.'D)?



- Maintaining proper nutritional balance in the feed and leach is important to keep plants healthy. This means proper balance of nitrogen and potassium. Lately I have seen some nutrient analyses where nitrogen is higher than potassium in the leach solution. This means that plants become more vegetative and could make it more susceptible to GSB and other diseases as well.
- Harvest fruit with a sharp knife and disinfect it frequently with bleach or other disinfectants.

Greenhouse Hygiene:

- Good hygiene is very important to keep the inoculums to a lower level. This can be achieved by removing infected plant material from within the greenhouse not by dragging the plants on walkways, but by bagging them and then removing them. Disposal piles near the greenhouse can also be a prime source of spores throughout the year.
- At the end of each crop, remove all crop residue and debris from the greenhouse, especially on wires and in temperature sensors. Avoid raising seedlings in the same area where mature crops are still around. Avoid intercropping if GSB is a major issue. Give a break between crops and clean thoroughly.
- Disinfect greenhouse structures at the end of the crop cycle. Many disinfectants are available to growers for this purpose.
- Pruning tools should be disinfected daily. Many growers use 10% bleach for one minute dipping.

Chemical:

- Many fungicides are available for the control of GSB. Spot spray where it is feasible.

Tomatoes – Powdery Mildew Mohyuddin Mirza

I have not seen tomato powdery mildew for several years but this year saw some pretty serious infections.

The picture below shows what the symptoms on leaves look like. The white spots move from lower leaves to upper leaves. If not brought under control there can be a significant reduction in fruit sizing and reduction in yields as well. The fungus in Alberta was identified as *Erysiphe* sp. There are some interesting facts about this fungus. It is a disease of low relative humidity although like *Botrytis* it needs free water to germinate its spores. One sees this disease starting near the fans and getting worse under dry conditions.

Growers use many reduced risk approaches to reduce its spread such as:



- ◆ Spraying water on a daily basis with or without a surfactant. Sometimes I have seen growing using baking soda, dormant mineral oil.
- ◆ Removing infected leaves at an early stage can help reduce the spread of this disease.
- ◆ Overhead misting to maintain a relative humidity of around 70% is beneficial.
- ◆ If possible keep the temperature below 21C.
- ◆ Avoid high nitrogen feed, that is over 250 ppm is considered high. Increase potassium in relation to nitrogen.
- ◆ Intercropping should be avoided when powdery mildew is an issue.
- ◆ There are many registered fungicides to control this disease.

Soft Shoulder in Pepper Fruit

Mohyuddin Mirza



This problem with one variety was reported by a grower and to a fairly significant level where large amounts have to be culled. It appears to be more common on thin fruit skin varieties. The skin will sink with a little bit of pressure. It is difficult to find one reason for this disorder, but general guidelines are:

- ◆ Focus on active climate early in the morning. It means that at night-time plants and fruits are subjected to lower moisture deficit due to high relative humidity. As the sun rises the leaf temperature also rises. If the relative humidity is not brought down so that the moisture deficit is above 3 grams/m³, then the supply of water to the fruit may be slowed down.
- ◆ Also try your best not to let the moisture deficit go above 7 grams/m³. It can happen very easily under low relative humidity conditions and warm temperatures. This means water could be lost very easily from the exposed fruit skin without being supplied from roots at the same time.
- ◆ In summer prune the plants in such a way that more leaves are allowed to develop and fruit is covered under those leaves.



Look at the picture above—this is an example of very generative pepper plants where not many side branches have been allowed to develop. Fruit is exposed. With high solar radiation it is important that more leaves are there to cover the fruit.

- ◆ Adjust irrigation practices to reduce root pressure especially the last watering. The practice of pre-night dipping should be carefully examined to see if it is contributing to soft shoulder.
- ◆ Make sure that the target fruit number is between 35 to 40/m² at this time of year.
- ◆ Maintain 3:1 ratio for calcium to magnesium and sulphates in leach water are not going over 200 mg/L

Tips On Managing Poinsettia Crops

Mohyuddin Mirza

By the time this newsletter reaches you, I am expecting that crops will be well rooted in pots and you will be getting ready for pinching. Here are some tips for you to grow quality crops. Remember that what you are doing now with the crop will determine the final quality of the poinsettias.

- ◆ Encourage maximum rooting by keeping the growing medium moist. Don't let it dry out. It is especially important if the rooted cutting was in a foam material like old oasis cubes. If the growing medium dries out, the roots will die off and it will take another two weeks for the new roots to initiate and that will delay pinching.
- ◆ Balanced nutrition is very critical when roots are fully developed. It is important to understand that maximum vegetative growth should be the target at this time. This is obtained by supplying at least 200 ppm of nitrogen along with calcium, magnesium, phosphorus, potassium, sulphur and all the trace elements. Calcium nutrition is very important for proper bract development. Ready made fertilizers generally don't have enough calcium in them. Check with the supplier as to calcium content. Remember that poinsettias require higher molybdenum levels right from the start.
- ◆ Make the decision to hard pinch or soft pinch at this time based on the branching characteristics of varieties. Enough information is provided by the supplier about this aspect of different varieties.
- ◆ Immediately after pinching, skip fertilizing for a couple of times so that the plant recovers from the shock.
- ◆ There are many growth regulators available in the market. Make your choice based on your conditions and what you want to achieve. Also growth regulators like Bonzi are needed in very small amounts. So make sure your calculation is correct. Over application can stunt the crop drastically and sometimes it becomes difficult to overcome that effect.
- ◆ Remember that poinsettias are light sensitive. On September 22nd the day and night durations will be the same, that is 12 hours each. The plant starts turning towards generative direction.
- ◆ Pay attention to day and night temperatures. For good rooting don't go too low on night temperature. If you need more information on temperature regime for poinsettias, let me know.
- ◆ Monitor the crop carefully for whiteflies and other insects. It will be easier to control them at this stage rather than at bract development side.

News release

APPLICATION FORMS FOR THE AGRICULTURAL FLEXIBILITY FUND NOW AVAILABLE

OTTAWA, Ontario, August 31, 2009 - The Government of Canada would like to remind farmers that the new five-year (2009-2014), \$500-million Agricultural Flexibility Fund (AgriFlexibility), is now accepting project proposals.

AgriFlexibility will support measures that reduce costs of production and improve environmental sustainability for the sector; promote value-chain innovation and sectoral adaptation; and, respond to emerging opportunities and market challenges for the sector.

AgriFlexibility includes both federal-led initiatives and initiatives delivered in partnership with provinces, territories and/or industry. Provinces/Territories and Industry will be able to submit proposals (at several stages) over the life of AgriFlexibility. Preference will be given to proposals which leverage private-sector involvement and investment; contribute to the efficiency or sustainability of the industry; and make positive, long-term contributions to the overall competitiveness of the sector.

For information on the Agricultural Flexibility Fund and on how to apply, visit www.agr.gc.ca/agriflexibility, email agriflex@agr.gc.ca, or call 1-877-290-2188.

Should you require more information, or if you have any further enquiries, please contact us for assistance:

Agricultural Flexibility Fund Administration

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Sneak Peak of 2009 Saskatchewan Green Trades Conference Program November 12 – 14, 2009

Join Saskatchewan greenhouse growers, field vegetable growers, florists, community planners and parks and recreation personnel at Saskatchewan's largest green trades conference and tradeshow!

The **Saskatchewan Green Trades Conference** to be held **November 12th, 13th & 14th** at the *Saskatoon Travelodge* brings together the provinces' **commercial greenhouse growers, garden centre retailers, field vegetable producers, municipal employees, community planners, parks and recreation, Communities in Bloom, florists and industry suppliers** in one location. It is the largest conference and tradeshow of its kind in Saskatchewan and is not only a chance for the industry to network but also an opportunity for professional development for these like-minded groups.

The conference offers two workshops and five concurrent speaker sessions totaling over 40 hours of presentation time and featuring some of the industries' leading experts, speaking on such topics as the latest growing techniques, development of community green spaces, marketing, water quality and organics. Sessions are organized into the following tracks: greenhouse vegetables, retail garden centre, bedding plants, field vegetables, Flowers Canada, and common green spaces.

Rounding out the conference are two general sessions. **The Art of Client Service... Influence with Ease** presented by customer service strategist and award winning speaker Jeff Mowatt will help attendees connect with their customers and position your ideas, products and services so that people select higher value options. While the other general session entitled **Keeping More . . . Secrets to Boosting the Cash in your Pocket** presented by guerilla marketing expert Bill McCurry, will be a dynamic idea exchange on dealing with the down economy, analyzing the business for maximum efficiencies, controlling cash flow and expenses, determining pricing, dealing with staff cut-backs, and inventory issues.

The conference also features two pre-conference workshops. **Starting a New Greenhouse? Let Dr. Mirza Help!** features greenhouse guru Dr. Mohyuddin Mirza presenting on all aspects of starting up a new operation. Dr. Mirza is well known in the industry and has helped many new producers get started. This will also be a great refresher course for experienced growers. The other pre-conference workshop, **Becoming a Service Icon in 90 Minutes a Month** features bestselling business author Jeff Mowatt sharing low-cost high-return methods to not only retain employees, but also motivate them to provide exceptional service. The result will be increased staff retention, strengthened customer loyalty, and enhanced team spirit.

The conference also offers several networking opportunities including a banquet and trade show. Suppliers from across Canada value this chance to meet face-to-face with their customers. Great speakers, networking, professional development, trade show and Saskatchewan hospitality – what more could you ask for!

Conference partners include the Saskatchewan Greenhouse Growers Association, Saskatchewan Vegetable Growers Association, Flowers Canada and Saskatchewan Parks and Recreation.

For Conference Registration and Program details, please contact or visit the Website.

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Farming Solar Energy (cont.'d)

a kilowatt hour for their power. As a relatively new technology, the capital costs are hugely expensive, but EdF-EN is undertaking this project under the Ontario Government's renewable-energy program wherein the provincial government is aiming to spend \$5 billion over the next three years. Several groups such as the Ontario Federation of Agriculture, the Canadian Institute for Environmental Law and Policy, and other rural organizations have raised concerns that solar farming would use prime farmland for generating electricity rather than for growing crops. The solar industry argues that such farmland tends to be flat, free of obstruction, inexpensive and close to distribution lines - all factors that improve the economics of their projects. The ground mounted solar panels intend to utilize a tiny percentage of Ontario's agricultural land. Farmers have the option to lease their land, or a portion of their land, over a period of 20 years, at which point the land is returned to the farmer in arguably better nutritional shape. Ontario farmer Tim Barrie currently grows asparagus and rhubarb and is now prepared to add electricity to that list. Barrie has been approached by Waterloo-based Arise Technologies to install a solar farm in an exhausted asparagus field. Barrie has moved asparagus out of the proposed solar field beside his house stating that a crop can only grow in one spot for 25 years before disease moves in; therefore 'growing' electricity in that vacant field only makes sense. Another farmer who traded in some of his pigs for solar energy panels claims his new venture is merely adapting to an economic cycle. While already popular in Europe and fairly extensive in the US, the solar energy generation is just now taking off in Canada, with Ontario as the leader. While solar energy is expensive to produce now, it is expected that it will be more economical as the industry matures.

Sources:

Ottawa on track to break trail on green power – Ottawa Citizen

Green energy could mean more green for farmers – Government of Ontario

The Greenhouse Business is a quarterly publication jointly produced by Alberta Agriculture and Rural Development and Dr. Mohyuddin Mirza.

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