

**Workshop Title:**

Improving Greenhouse Practices

**Speakers:**

Philippe-Antoine Taillon

**Executive Summary:**

The speaker continued from his previous session that explained the problems with greenhouse management in NB. He then continued to explain practical ways that greenhouse users such as those in his study can improve their practices.

**Main Notes:**

- A continuation of the previous workshop on Greenhouse Management in NB.
- Advantages of double rows
  - Plastic is easier to install
  - More space to distribute solid fertilization
  - Easier to work, do grafts, etc. because grower is working two rows at a time
- The cover
  - It's important to look at this, it is an investment and you normally have to change it 3-5 years.
    - Characteristics are thickness, weight, price, resistance and durability, as well as anti-condensation
    - There is a double thick plastic, allowing moisture to accumulate in between the layers
      - Anti-condensation is normally usable for two years maximum

- Some can have thermos characteristics such as vinyl acetate that is more opaque and conserves heat during the night
  - The speaker showed the permeability of a treated vs. a non-treated plastic
    - It is important to have an infrared plastic for all greenhouses
- Polyethylene is good for structures
  - It is anti-condensation and infrared which can be used for large tunnels
- Patterns
  - The thickness before was 6 mm, it is now 7.2 mm
  - Anti-condensation allows for 5% more lighting
  - 150 um films can be used 2-3 seasons, whereas 180 um can be used 3-4 seasons
  - Need to take this seriously
  - In the future, there will be photo-selective films that can diffuse light which is more efficient
- Ratio of aeration
  - Ratio obtained is a measurement of the open surface
    - So if the grower rolls up the plastic, this can be used to measure the ratio
  - Opening ratios that are suggested depend on the tunnel
    - Grand tunnel 10-15%, large plastic/multi plastic greenhouses between 20-35%
    - Less than this can cause damage

- Position of the vent is contrary to the dominant wind
  - Want to cause a suction effect, and the wind will use this effect
- A 3 or 4-foot fan can be used in a 21-25 ft. by 100 ft. greenhouse
- Heating
  - Some growers were getting ready to install heating
    - Heating power of the surface is 4 BTU/hr/m<sup>2</sup> of the surface per 1 degree Celsius/ change in temperature
    - For example, in Moncton in April, the average temperature in April is -9.9, so 140 000 BTU or 41 kW is necessary to heat the greenhouse if it is well done
      - Find your growing temperature and you can determine the size of the heater you need
  - Normally, one polyethylene pipe per row should be used to get warm air from one end of the greenhouse to the other via holes in the pipe
    - Furnace should be at the North because the light from the south can be used for the south end
  - Heating the soil is often neglected
    - Important for cucumber
    - Circulate hot water, 35-55 degrees in the soil can help with this
      - Has to be designed to distribute hot water equally
    - If you spray a lot with colder water, you are destroying the work you have done so have the water at least 18-20 degrees
- Pollination

- Do not depend on the wind for tomato pollination
  - Pollinate each day with a vibrating wand, by hitting the wires or by a blower
- Best to use pollination with bees
  - Not costly, produces better fruit
  - Normally stay around your crops
- Production of transplants
  - Plan the number of seedlings that are good for your greenhouse
    - Ex: want 10 000 tomatoes, need 12 000 – 13 000 seeds
      - Slightly higher number of seeds
  - Be aware of the germination temperature for each vegetable
    - If you have the right temperature, it will be a shorter germination period
  - In producing seedlings, the most important part is the initiation of the first part that takes place between the cotyledon and leaf stages
  - Temperature regime is very important as germination time determines the time of harvest
    - Speaker provided a table of germination time to harvest time, showing that the later germination results in later harvest
  - Speaker has shown three methods of transplanting
  - Proper transplanting will cost less money and space in a nursery as you can get two fruits instead of just one
- Grafting

- Mostly done for resistance of root disease
  - Plant becomes more vigorous and can thrive in stressful periods
- Can graft using certain tools that are outlined by the speaker
  - Knives, domes, pulveriser, etc.
- Cut the graft and glue it to the other plant
  - Not a very difficult technique, but effective
- Conditions for success
  - Humidity 90-95%
  - Temperature 21-22 degrees
  - Light low
- Lots of YouTube videos on how to graft
- Take into consideration the depth of planting, too deep can cause disease susceptibility, and suckers must be taken out
- Before grafting, choose cultivars properly
  - Speaker will not go into great detail, but will give a guide to the room attendant to distribute
  - Determine growth for greenhouse, taste, resistance, tolerance, size, etc. for all crop choices
- Managing temperature
  - Ideal growth temperature is elevated with tomato
    - Grow quicker, have higher yield
    - Temperature depends on light
      - Mature plants can mean you can reduce the temperature

- Irrigation
  - Recommendations are to increase height of water and plastic over rows to hold humidity
    - Irrigation tape should be on the higher points on the rows
    - Drip tapes should have close spacing when punching holes
      - Photos are provided by the speaker
    - Irrigation is not very wide, which is why several tapes are needed, and even on both sides of the plant row
      - 6 L/m<sup>2</sup> normally per day
- Fertilizer
  - Add compost, chicken manure, potassium, etc.
    - Amount of fertilizer is recommended based on annual yields
      - A table was provided by the speaker as an example
    - Without knowing your yield, it is impossible to make a recommendation
  - Apply fertilizer every two weeks under plastics
- Phyto protection
  - Nets against cucumber beetle that also slows the wind
  - Dehumidification against gray mould
  - Humidification against mildew
  - There are different products that can be applied, but are not recommended
- Extra work

- Deleafing will free up clusters at the bottom, pruning will help yields as well
  - Remove first fruit to ensure continued growth of fruit
- Focusing on what the speaker has mentioned should help with greenhouse growing in New Brunswick
- Questions:
  - Can you explain the umbrella for the cucumbers in English
    - You take the main stem and make it grow until the support wire, and alter the direction of the stem and let it fall
    - Pinch ends off