2016 ACORN Conference & Trade Show

Delta Beauséjour Hotel, Moncton NB

Workshop Title:

Greenhouse Management in NB

Speakers:

Philippe-Antoine Taillon

Executive Summary:

The speaker explained what he saw when he studied greenhouses in NB specifically. In this session, he simply outlined the problems he saw with how greenhouses are managed in NB. He touched on all aspects of greenhouses and how they were managed.

Main Notes:

- Speaker helps those who have greenhouses in their efforts for greenhouse management and production in greenhouses
    - What interested the conference from his projects is that in august, he was invited to analyze how we proceed in New Brunswick greenhouses and how to improve
    - The speaker will express what he saw then explain how to make Greenhouse usage better in NB
- Speaker is an agronomist, teaching and some of his students are here today
    - He has had great visits and he is an expert working with Climax Counsels Quebec
    - Has helped Greenhouse producers in both Quebec and Ontario
    - Helps producers to have on average 1475 m^2, they can have up to 4 hectares

    - In NB, it is very similar to Quebec with regards to Certified Organic production
        - Speaker managed projects, gave supervision and training
        - Speaker helps with 8 producers, and will give an update today
    - This session is the contextual setting to how to improve
- Objective of producers that speaker visited was to have crops as soon as possible, and the best yields possible, to fertilize one time only before planting, natural pollination, and to limit work while having unlimited control of greenhouse
    - Visited many businesses with business models
        - Some to have harvest as soon as possible, and to do that the grower has to be in a heated house with unlimited control
        - Majority of visited business was a greenhouse without heat
            - Therefore, objective did not line up with reality
            - Speaker will give tools to have early crops in the next session
    - Analysis is somewhat negative, and the speaker warns to not be upset
- The layout of the greenhouse
    - Basic principals were not always respected
        - Spacing of 1.6 m between rows, 0.6 m spacing between wires at a height specific for each vegetable
        - Leaves of plants will also be in the row, but ideally want to have 1 m to work between rows
        - Crops were done on single row crops

        - Some were done in double rows, some were staggered in a V shape
- The speaker showed rows of tomatoes
    - The speaker says that the rows shown were not ideal, and twice the number of plants could have been put into this greenhouse because there was just one single row at a time
        - The speaker recommends double rows
    - In some areas, there was one wire in one single row. That made it difficult to work between the rows
    - Should not be able to see through the plants
    - Some businesses had double rows, but space between rows was not ideal
        - Some were too close, some too far creating a lack of density which is less dense therefore less productive
- Because the layout was not idea, there was a low density of crop
    - Speaker saw single plants by themselves, and was able to see between the plants which is not a good density
- If the layout is not normalized, the density is not possible and the grower cannot have total control of the environment and it could encourage pests
- The speaker showed a diagram of an ideal layout
    - The greenhouse is 6.4 m wide, with three, double rows and two single edge rows
    - The greenhouse is 7.62 m wide with five, double rows
        - This is recommended to those with experience, as it can be difficult

    - The greenhouse is 9.14 m wide with six, double rows
        - Recommended for very experienced people with total control of the environment
- Optimal layout in a green hose
    - You can choose the ideal crop density
        - Chart provided for tomatoes, cucumber, peppers and eggplant
            - The density in the chart is inversely proportional to the size of the fruit. Small fruit means grower can grow larger quantity. This is necessary for a high yield
            - Density goes with experience, and control
- Ventilation Management
    - Important in a greenhouse
    - All greenhouses visited had good management with a ratio of opening that respected what they should do
    - Openings were open when hot, but there was a lot of discussion about nets, but nets do restrict vents so the speaker warns to choose the proper type of nets
    - Very little mechanical ventilation, which the speaker is happy about because it costs a lot in electricity and it’s not natural which is the best
- Heating of Greenhouses
    - Two businesses were heating; most were cold or tunnel greenhouses
        - Heating is very important, and it is important for the cucumber in particular

- Pollination was the most problematic
    - Wind is not enough, does not work in cold and a net to protect does not let pollinators in
        - Cucumbers and peppers do not need pollination if cultivars are well chosen
    - Crops should all be the same size, and if there is drastic changes that's a problem
    - Manual pollination is possible with tools, but it is labour intensive
    - The recommended solution is bees to pollinate
- Production of transplants
    - Little production of transplant
    - Very producers would pinch tomato or cucumber
        - This would give two heads from one seed opposed to one
        - Pepper and Eggplant do it naturally
        - Brings a larger yield
    - Few plants were grafted, few producers did this
        - Some were organic, some were not
        - Not grafting will mean 10 – 100% less of the harvest
            - Some claim it does not happen, but when it does it can be very quick
- Grafting
    - Those that grafted, the grafted plants need to be managed a certain way in order to get lots of fruit

        - If buried too deep, it can cause the graft to be more susceptible to sickness
        - Not an expense, an investment
- Cultivar choosing
    - Some were not well chosen
    - Some should not have been grown in greenhouses, the grower must chose cultivar well
    - Resistance and tolerance was not thought of in most cases
        - This means the loss of yield, time, and materials that you must buy to treat the sickness
    - Cucumber is susceptible to all kinds of sickness, so it is important to have cultivars that are resistant
    - There is no need for pollination in cucumber, so that should not be a factor
    - Growers can choose peppers for optimum growth, but normally they weren't chosen well
        - For example, one variety can focus on fruit while one focuses on the fruit
            - Therefore, we can illuminate the one that won't produce good yield
- Management of Temperature
    - 90% of speaker's work is around temperature
    - In these greenhouses, when it is hot you can only open the greenhouse

        - When weather is not as warm, if you do not manage temperature well it hurts your yields
        - Grower can manage to keep more warmth in the greenhouse
- Irrigation
    - There was very little budding of the rows and an insufficient amount of irrigation per rows
        - Some areas did not have mulching on the ground, which allows humidity to come out of ground
            - Not enough mulch in places that did mulch
                - Sometimes it was not the right amount
            - Straw is recommended as a mulch because it controls humidity
                - Plastic is not optimum, it's better than nothing but not as good as hay
    - Dug down into the ground, and it was dry in most greenhouse
        - If the grower wants good fruit, they need proper irrigation
    - There are basic irrigation principals to understand
        - If roots work less to find water, the yields are better
- Fertilizer
    - Fertilizer use was good
        - Mixes were okay
    - It is difficult to measure anything when growers do not measure the yield
        - This is key to make a recommendation

        - This is hard for growers, so the speaker had to base recommendations on color of yields, and the speaker does not prefer to do this
    - Recommendation should be based on yield and nothing else
- Crop protection
    - There was a lot of damage from disease and pests
        - Plants were great, but there were a lot of pests such as bugs that there was no fruit (tarnish plant bug, potato beetle, spider mite, etc.)
    - Phytoprotection
        - Botrytis (gray mould) was a problem that hinders yield
            - Attacks stems, leaves as it comes into the main leaf veins
    - Evidence of high humidity such as:
        - Roots growing on the stem is an indicator
        - Condensation on leaves is an indicator
        - Speaker showed growers how to get rid of sickness
            - Cut up and down, put a bag over it so the spores do not spread
                - When there is a lot in the field it's hard to do anything about it
    - Grower showed to pick off leaves at some points because too much leaves is not necessarily good
    - No topping done at the end of season, which is a practice to maximize yield at the end of the season

        - If grower does not, fruit will not be good enough for market
    - There was no management of the size of fruits in peppers as well
        - Must take away first fruits, this was not done
- Automatization
    - This was beginning as some growers thought of putting a heating system in their green house
- Sickness were the same as in Quebec, but there is not a whole lot of data on diseases
    - It is important to have numbers to know where you are going and what to do
- Prioritize for next season
    - Pollination with bees or manually,
    - Density cultivars for specific greenhouse
    - Work plants more
    - Manage temperatures well
    - Short term: protection of plants
        - There are ways to reduce application of fertilizers
- More details to follow in next session
- Questions:
    - How many beehives are good?
        - When you buy a beehive, one hive is good for a lot of area, 1000 m^2

        - A hive is a false queen with workers, and a hive will last about 8-10 weeks and you'll have to replace it
        - Some people are experts in managing hives
    - If you were going to use netting, what you would you suggest?
        - There is a guide that gives all of the different types that help with the pests and state the sort of material that is used
        - You really need to be aware of reduced ventilation
        - Nets will also prevent wind
        - Just go to Google and type in nets and you should get that information
    - Do you put the hives in the greenhouses?
        - There are hives for interior or exterior of greenhouses
    - High tunnels, are they good?
        - The speaker has not done a lot of research into high tunnels, but the difference is that a big tunnel leaves big spaces between rows
        - What speaker is talking about is for cold climates, so greenhouses are ideal