

**Workshop Title: Protected Structures for Sustainable Raspberry Production**

**Speaker & their title:** Jean-Pierre Privé (Plant Medic Inc., NB)

**Executive Summary**

In this session Jean-Pierre discussed season extension techniques using various protected structures including high and low tunnels, row covers and rain covers, as well as cultural practices and cultivar selection for raspberries. He compared the Maritimes to BC, which traditionally produces an abundance of this crop. Through his talk he frequently reminded the audience to cultivate the scientific mindset and to always experiment, test, and adjust growing techniques and practices, as well as varieties selected.

**Detailed Notes**

Jean-Pierre began his talk with a discussion of Red Raspberry production in Canada showing that British Columbia produces an abundance of the raspberry, which is typically a maritime crop. The Maritimes and BC have similar climates although BC has a more moderate season that is less variable at the extreme ends of the temperature spectrum. Raspberries are very sensitive to too much water—which can damage the shelf life of fruit—and wind pressure. In comparing growing condition between the Okanagan Valley and the Annapolis Valley, we can learn lessons about raspberry needs. Given similar seasons, the limiting factor for raspberry growth in BC is late season cold, whereas in the Maritimes it is rain distribution. Growing raspberries in the east it is important to have a N-S orientation of the rows and to keep them pruned narrow, and some protective covering is required to keep excess water directly off fruit and foliage, which can contribute to disease and pre-mature rot. However, protection such as floating row covers and rain nets requires more management. Early season cold in the east as compared to BC can be offset using floating row covers to stimulate growth. Cultural practices are important to take into account as well; for example in order to grow thornless blackberries which require protection over the winter, a shifting trellis system can be used to lay the blackberries down at the end of the season and cover them. Understanding genotypic variability is also important in order to tailor cultural and growing practices to extend the traditional growing season.

On slides 9 and 10 Jean-Pierre discussed the effect of wind on raspberries showing that 50% wind protection from a snow fence can significantly impact foliage growth and fruit yield. However, in sheltered conditions the plants will want to grow lots of foliage that will have to be managed for the optimal foliage-fruit balance.

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Slides 11-13 discuss primocane varieties. Cane diameter is directly proportional to yield so when renovating plants select 12-15 canes per meter to keep and choose the thickest ones. Cane density is also an important factor on yield; more cane dense rows will yield more, but smaller fruit; however the more dense, the more difficult to manage pests and disease. Timing of cane removal is critical, it is important to renovate when primocanes reach 3-4 inches. Go early, thin out, choose thick canes—bigger fruit, better yield, less disease.

Management of conventional cultivars as biennial bearing primocanes can be used as a tool. If out of control or for other reasons you can mow these varieties down and select appropriate canes for propagation the next season.

Understanding environmental elements and conditions to adapt strategically is essential for season extension. Determine what you are given by the environment and how you can capitalize with cultural practices and behavioral properties of different cultivars.

One of the most important factors to be considered in the management of raspberries is soil temperature. The plants cannot make use of fertilizers or minerals until the soil temperature is 12 degrees Celsius, applying fertilizer amendments before this will have a negative effect on growth. Floating row cover and manipulation of mulches (removing straw mulch, for example) can increase soil temperature early in the season. It is also important to take into account soil pH and relative mineral interaction. Understanding soil type and cultivar needs allows for a balanced application of fertilizers and mineral amendments. There is no set formula: trial, test and adjust.

On slide 22 Jean-Pierre discussed the concept of managing raspberries as an agro-ecosystem. This allows the grower to have a more holistic view of the soil requirements and beneficial insects, as well as other complimentary processes. Protected structures and rain coverings will affect the way these systems perform differently and Jean-Pierre showed some of his research and trials on these various management techniques. In approaching crops as an agro-ecosystem, trophic levels are examined including soil microorganisms, plant productivity and beneficial insect life. It was shown that protected structures such as walk-in tunnels increase plant productivity and insect life, however using a rain shelter and reflective plastic mulch has the most benefit on soil health, plant productivity and the presence of beneficial insects and greatly reduced risk of disease.

Jean-Pierre then moved onto a discussion of high-tunnels and their advantages. Average temperature in high-tunnels is greater than outside due to higher temperature extremes rather than sustained high temperature. These structures lose their heat at night thus providing a more variable environment unless heat

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can be captured and released slowly over night. Also, available light in tunnels tends to be less and raspberries like warm roots and cool shoots. There is also an increased risk in disease due to higher temperatures and humidity. These structures require more management, planning and observation but generally yield more, and bigger fruit. **Again**, different cultivars behave differently under different conditions so do your research before growing and test, test, test!