

## **Tunnel-growing Systems for raspberries**

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1. Investigate cultural aspects of sustainable tunnel and other protected cultivation systems in Canada.

Trials with three primocane-fruiting red raspberry cultivars (Autumn Britten, Joan J and Polka) were planted at the New Liskeard Agricultural Research Station and the Cedar Springs Research Station in mid July 2010 and two floricanes cultivars (Nova and Prelude) in 2011. The plants were planted either outside, under high tunnels, or outside under umbrella systems which were erected in 2012, with four replicates of 25 plants. Plant growth and berry production are being assessed.

In the first experiment, the three fall-bearing raspberry cultivars, Autumn Britten, Joan J and Polka were harvested in 2011 with only two treatments – multi-bay high tunnel and outside. At both New Liskeard and Cedar Springs, plants in the high tunnels yielded more fruit than those outside, and they had a longer fruiting season. Harvests in 2012 included all three environments: high tunnel, Voen cover and outside. The results in New Liskeard indicate that yields were four times greater in the high tunnel than outside. There were no significant effects of the Voen covers on the yield, but the plant growth was positively affected. In Cedar Springs, the yield was more than two times greater in the high tunnel than in either the Voen cover or outside.

2. Develop and test new cultivars adapted for high tunnel systems

Eighteen cultivars and selections were crossed together to produce seed. These included: primocane-fruiting cultivars Autumn Britten and Polka; floricanes cultivars Canby, Tulameen and Glen Ample; five primocane-fruiting selections from Ontario; three floricanes winter-hardy selections from British Columbia and three from Ontario; and two winter hardy primocane cultivars, Pathfinder grown in Quebec and Honeyqueen grown in Saskatchewan. Seeds have been pretreated, germinated and certain crosses selected at the seedling stage for the spine-free trait.

Crosses were made in the late fall –winter 2010/11, 2011/12 and 2012/2013. Seed was germinated during the spring and summer of 2011 and about 450 seedlings produced. These seedlings were overwintered in cold storage and planted in tunnels at Strawberry Tyme Farms, Simcoe, in May, 2012. Seed produced by crosses in 2011/2012 was germinated during the spring and summer of 2012, and 10 of the 45 families were screened for the spine-free trait. Between July and October of 2012, 800 more seedlings were planted in tunnels. The 1200 seedlings include over 200 spine-free selections. Additional germination of seed produced in 2011/2012 was begun in January 2013.

3. Conduct economic studies to quantify the feasibility and cost-effectiveness of growing raspberries in high tunnels and umbrella protected cultivation systems.

Data from the Report by D. Yan and C. Du in 2003 entitled ‘Economic Feasibility Analysis of Raspberries under Protective Structures in Ontario’ is being updated. This report indicated that tunnels could provide an Internal Rate of Return of 35%.