New Initiatives in Orchard Physiology and Management Systems for Peach, Cherry and Plum


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Program Goals

To provide Ontario orchardists with the technology to produce premium quality fruit consistently, competitively, and profitably using sustainable orchard practices.

To enhance our understanding of the physiological processes influencing tree growth, flowering, productivity and fruit quality.

Research focus

Fruit Tree Water Relations and Rain-Induced Cracking of Sweet Cherries

- Explore the influence of soil moisture on growth, productivity and cracking propensity of sweet cherries.
- Evaluate beneficial soil management and micro-irrigation systems for peaches and cherries.
- Establish alternative methods for over-head irrigation systems.
- To quantify new, environmentally responsible methods of orchard irrigation such as subsurface drip, mulching, and advanced trickle irrigation technologies.

Microsprinkler emitters and battery operated irrigation timers assist in water conservation and help to prevent groundwater contamination of nutrients and pesticides that may result from excess overhead watering.

Tree Physiology Research Leading Toward Better Management Practices for Stone Fruit Orchards.

- Improve methods for sustainable production of stone fruits within and beyond traditional productions areas.

Evaluation of Peach Tree Forms

- Compare USDA developed “upright” and “pillar” peach trees for their potential in high density plantings of “fusetto” or “central leader” training systems.
- To determine growth, fruiting and yield parameters of four distinctive growth forms: pillar, upright, intermediate, and standard.

“Pillar” form, peach tree cv. ‘KV930455’.

“Upright” form, peach tree cv. ‘Babygold 5’.

Research Based Rootstock Evaluation to Guide the Industry

- Determine the precocity and productivity of new advanced peach, cherry and plum rootstocks and make recommendations for Ontario tender fruit producers.
- Compatibility of rootstock/scion combinations.
- Size control.

Plant Bioregulators to Regulate Cropping, Improve Production Efficiency and Fruit Quality

- Establish new crop load management strategies to enhance fruit size and fruit quality.
- Develop and evaluate new PBR technologies to delay or inhibit production.
- Determine the response of peach (*P. perisica*) and cherry (*P. avium*) trees to several rates and timings of applications of giberellic acid (GA3).
- Investigate alternative methods to hand thinning.

Recent Highlights

Performance of ReTain™ on Peaches

The plant bioregulator, aminovinylethoxyglycine (AVG), commercially marketed as ReTain, has the potential to aid in the harvest management of peaches by influencing the pattern of ripening, reducing fruit drop, and improving fruit quality. AVG has been tested on ‘Venture’ and ‘Babygold 7' peaches.

AVG significantly delayed fruit maturity by up to 5 days and increased fruit firmness at harvest (Fig. 1.) and after two weeks in cold storage.

Figure 1.

Sweet Cherry Production Poised to Expand in Niagara

There is quite revolution in Ontario cherry orchards! Interest in the production of sweet cherries is strengthening with the availability of later maturing, large self-fruitful cultivars, availability of dwarfing rootstocks, and advanced growing systems. Smaller trees utilizing dwarfing rootstocks will provide new prospects for rain covers, bird netting, and pedestrian orchards for pick your own operations. Our rootstock research indicates that the German ‘Gisela' and ‘Wieroot’ series of rootstock offer some distinct advantages for tree size control and improved precocity compared with the industry standard, ‘Mazzard’.

The major production issues of growing cherries in Ontario include brown rot, bacterial canker, and bird control. However, arguably the over-riding factor limiting production is caused by rain-induced fruit cracking.

Conventional wisdom has been that cherries only crack in response to rain deposited on the fruits. However, some cracking may be caused, and all cracking made worse, by high water levels in the rest of the tree, and high humidity surrounding the tree. The only way ripening fruit can lose excess water is by transpiration through the skin. Consequently, high humidity and minimal air movement within the tree canopy, are likely to increase the incidence of cracking following rain. Our research is focused on understanding and investigating methods to mitigate rain- and tree-induced fruit cracking.

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