

6.0 SUMMARY OF SELECTED RESEARCH PROJECTS

6.1 Plant Bio-regulators to Regulate Cropping, Improve Production Efficiency and Fruit Quality

- Have made significant progress in developing reliable commercial techniques to blossom thin peaches, nectarines, and plums
- In collaboration with Dr. E. Coneva, have discovered that late autumn treatment ethephon to *Prunus persica* delays bloom the following spring by up to one week, reducing the risk of spring frosts.
- Have identified compounds, several which meet new organic standards guidelines, that can be used to blossom thin apples and peaches. Intellectual property discussions with the Office of Research have been explored.
- Have conducted research on the economics of fruit thinning that indicates losses in yield are not always offset by the increases in grower returns for fewer, but larger fruit achieved through fruit thinning.
- My research has shown that gibberellic acid sprays can be used to minimize biennial bearing of apples (GA₄₊₇) and reduce the need for hand or chemical thinning.
- Have published research that demonstrates that gibberellic acid (GA₃) inhibits the flowering of *Prunus*, a phenomenon that can be used commercially to regulate the crop load and profitability of growing peaches and cherries
- Published results on the benefit of using gibberellic acid to delay maturity, increase size and firmness, and reduce rain-induced cracking of sweet cherries.
- Discovered and published data on a new compound, prohexidione calcium (Apogee™), demonstrating its effectiveness in reducing vegetative growth of *Malus* by 40% and that it can also aid in the control of secondary fireblight (*Erwinia amylovora*).
- Completed a new colour OMAF factsheet titled “Apogee® - A New Plant Bioregulator For Apples” (2006).
- Reported and published on the benefits of aminovinylethioxyglycine (AVG) on premature fruit drop, fruit firmness, and maturity of ‘Venture’ and ‘Babygold 7’ peaches.

6.2 Identify adaptable tree fruit cultivars with a range of ripening dates useful for fresh market production

- Completed a new colour OMAF factsheet on “Commercial Production of Honeycrisp Apples in Ontario” (2006).
- Published results from our cooperative USDA NE-183 Apple Germplasm Project.
- In 2004, established a randomized and replicated peach research orchard in Simcoe to conduct research for sustainable peach production outside of the Niagara Peninsula. This fruited for the first time in 2006, providing very impressive fruit quality and yield data.
- Collaborating with Dr. Cheryl Hampson on genetic-environmental interactions that influence the performance of new advanced test apple germplasm from AAFC, Summerland.
- Contributing content regularly to OMAF Publication 360, website and newsletters on apple cultivar suitability and performance in Ontario.

6.3 Apple, Peach, Plum, and Cherry Rootstock Physiology

- Continued research for the commercial development of the Vineland series apple rootstocks through testing in USDA NC-140, and the Canadian Prairies.
- Published results on the performance of apple, cherry, and peach rootstock and rootstock/scion combinations under different orchard management systems.
- Have made recommendations on suitable rootstocks for commercial tree fruit producers.
- Completed and published several long-term experiments on the performance of several *Malus* and *Prunus* rootstocks on precocity, production, and tree growth.

6.4 Water Relations, Irrigation, Physiology of Rain-Induced Cracking of Sweet Cherries

- Have conducted and published research which compares tree covers and calcium chloride misting systems and their ability to reduce rain-induced cracking of sweet cherries.
- Elucidated the influence of soil moisture on the establishment, growth, productivity and cracking propensity of sweet cherries.
- Reported on efficient and beneficial soil management irrigation systems for tree fruit (apple and cherries).