Cherry Notes

Newsletter of the Okanagan Kootenay Cherry Growers Association

September 2008 Issue

Comments from the Editor

The September Newsletter includes a summary of research work covering antioxidant contents and activity of sweet cherries by Joe Mazza and the similarity of two modified packaging boxliners by Peter Toivonen is included in this issue of the Cherry Notes.

The upcoming meetings of the Executive of the OKCGA will include discussion concerning research funding issues. Please contact Brian Mennell Research Director (bmennell@nethop.net) if you have any research issues. Please contact any member of the Executive if you have any concerns, questions, or suggestions. Contact information can be found at http://bccherry.com/contact-us.asp.

Please direct Newsletter ideas and suggestions to Frank Kappel Newsletter Editor kappelf@agr.gc.ca or 250-494-6373.

Research Shorts

Antioxidants and Antioxidant Activity of Sweet Cherries from the Okanagan

G. (Joe) Mazza, Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Summerland, B.C. V0H 1Z0

Oxidative stress and antioxidant deficiency have been implicated in the pathogenesis of many diseases and conditions, including atherosclerosis, cancer, ageing, and respiratory disease. Consequently, over recent years many different antioxidant combinations and antioxidant-rich foods, such as fruit and vegetable juices and other plant extracts have been developed and commercialized. The aim of this project was to determine the qualitative and quantitative composition of

antioxidants, anthocyanins and colorless phenolics in selected cultivars of sweet cherries important to the Okanagan and Kootenay Cherry Industry.

Five sweet cherry cultivars (Lapins, Skeena, Staccato, Sweetheart, and Sentennial), produced commercially at five locations in the Okanagan Valley were evaluated for antioxidant activity and contents of antioxidants. Cherry samples taken were fresh market-grade and culls (small and splits). Using a number of techniques antioxidant activity of extracts and contents of antioxidants, including anthocyanins, flavonols, hydroxycinnamic acids and ascorbic acid, were determined. A total of 153 cherry samples were analyzed.

The antioxidant activity values for all samples were relatively high. The activity was affected by cultivar, and to a lesser extent by location (production/management practices). Skeena, Lapins and Sweetheart had higher antioxidants and antioxidant activities than the other cultivars evaluated. The total phenolic content determined by the Folin-Ciocalteu method and expressed as gallic acid, ranged from 125± 1 for Sentennial, 126± 5 for Staccato, 150± 3 for Sweetheart, 153±12 for Lapins and 180± 12 mg/100 g of edible cherry weight for Skeena. Anthocyanins in cherry samples ranged from 57-232 mg/100g. Anthocyanins and other phenolics were also present in higher amounts in Skeena, Lapin and Sweetheart cherries than in the other cultivars. The content of phenolics in the cherries was significantly and positively correlated with the antioxidant activity. These correlations confirmed that the phenolic compounds are the molecules responsible for most of the antioxidant activity of sweet cherries.

Altogether, these data indicate that antioxident activity and, anthocyanin, and total phenolics contents were significantly different in various cherry cultivars. They were also significantly affected by production location/harvesting time. A significant interaction between cultivars and production location/harvesting time was found for DPPH, TEAC and FRAP values, tartaric esters, flavonols and total phenolics contents but not for anthocyanins. Ascorbic acid content of cherries was relatively low (6.8-15.5 mg/100g) but differences among some cultivars were significant, with Sweetheart and Staccato containing higher amounts than the other cultivars.

The contents of antioxidant components and antioxidant activity values for cherry culls (small and splits) were very similar to the values for fresh market-grade cherries. This finding indicates that the availability of 500-600 tonnes of cull cherries available annually in the Okanagan presents an opportunity for the development of value-added antioxidant-rich products from cull cherries. Thus, further research in the technological and commercialization aspects of antioxidant-rich products from cull cherries is recommended.

Acknowledgements: Jan Langton (IRAP) and Glen Lucas (BCFGA) for financial support and Lana Fukumoto for technical assistance.
For further information contact Joe Mazza mazzag@agr.gc.ca

Up Coming Events

BC Farm Assessment Review Panel is conducting a series of public meetings in its efforts to properly redefine what constitutes a farm, as it relates to the property tax assessment system. A meeting is scheduled for the Okanagan on October 15th in Penticton – time and place to be determined.

REGISTRATION: To participate please register via email farmassessmentreview@gov.bc.ca or phone at **1-866-956-7551**. Registration for presentations is on a first come first serve basis, so please register early to guarantee attendance.

To view a summary of completed consultations, visit the consultation summaries page. To make a written submission or provide suggestions on consultation topics, please email us at: farmassessmentreview@gov.bc.ca or call **1-866-956-7551**

BCFGA Horticultural Forum and Tradeshow

Join us at the Penticton Trade and Convention Centre on November 8th, 2008 for the BCFGA Horticultural Forum and Tradeshow.

Research Shorts

Comparison of Two Commercial Modified Atmosphere Boxliners for Sweet Cherries

. Peter M.A. Toivonen, Frank Kappel, Brenda Lannard and Darrel-Lee MacKenzie. Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, British Columbia, V0H 1Z0

Selection of proper box liners for cherries is an issue which faces the sweet cherry grower/shipping industry, particularly since there are new options that come on to the market on a regular basis. Some boxliners are nothing more than barriers to water loss and may well be acceptable for commercial application if the shelf life expectations are short (e.g. for local markets). However, if longer shelf life is needed, then sweet cherry shelf life can be extended by having packaging which allows an accumulation of high carbon dioxide (~ 8-15 %) in the package, while

maintaining oxygen above 5%. The high carbon dioxide is important in controlling decay in the stored fruit, while high oxygen prevents the induction of off-flavors that can occur in response to low oxygen atmospheres.

In this work, two box liner films were tested. The first is Lifespan, which is a film that has been available from Australia for some time. It is impregnated with clay particles and it is also "stressed" by prescribed post-cast machine stretching. The combination of impregnation and stretching gives this film a unique permeability characteristic that maintains high oxygen and high carbon dioxide atmospheres. The second film is a newly developed micro-perforated film produced by "sparking" ~60 micron diameter pores into any plastic film. It is produced by UltraPerf in Saint-Jean-sur-Richelieu, Quebec. The micro-perforated film also has the characteristic of producing a high oxygen, high carbon dioxide internal atmosphere.

The goal of this work was to evaluate the performance of these two commercially available sweet cherry boxliners with commercially grown and packed sweet cherries. Okanagan Harvest cooperated in allowing us to intercept cherries that had been picked and packed at their facility. The three major cultivars were all tested in this trial (Lapins, Sweetheart and Staccato).

The quality of the cherries held in either box-liner was similar up to six weeks in 1 °C. Pitting, which increased in storage, was similar in both liners and firmness also increased in storage but was similar in either box liner for each cultivar. Stem browning increased similarly for Lapins and Sweetheart but was much greater in Staccato, but in all cases the browning was similar whether the fruit was packed in Lifespan or Ultraperf box-liners. Acidity was low in Lapins as compared with the other two cultivars. Titratable acidity declined steadily over time in storage, but this decline was similar for both liner types. The weight loss was greatest with Sweetheart compared with Lapins and Staccato, but it was similar in either type of box-liner. There were no differences in decay between the cultivars and the decay levels were identical from the two different box-liners. Atmosphere analysis of the packages showed that the carbon dioxide and oxygen concentrations were very similar, when any of the three cultivars were packaged. The high carbon dioxide levels would be expected to control decay, which is supported by the low levels of decay at six weeks of storage.

In conclusion, the results from this work show that both the Lifespan and the Ultraperf packages can produce the same results when used in all three major cherry cultivars. The reason for this is that the two technologies generate similar atmospheres. Therefore, it would be appropriate for industry users to determine which of the two liners they select based on other issues such as price and service, since performance is similar for both.

For further information contact Peter Toivonen toivonenp@agr.gc.ca.

BC Provincial Sales Tax

The BC Government is not showing signs of implementing the Provincial Sales Tax reform for agriculture – a wasted process that means we are left with the archaic system we had before – and have lost four years in getting updates to that. BCAC will be submitting requests for items to be added to the exemption list. Please notify Christine Dendy christen@dendy.ca if you have items you think should be added. Detailed descriptions are required. We will be resubmitting the same requests we have asked for the past six years – such things as hydro-cooler and cold store refrigeration units and related repairs, all packing materials, forklifts, costs relating to requirements for certification and safety regulations.

BC Environmental Initiatives

Emily MacNair, previously with IAF, has been appointed as the Agricultural liaison for the BC Climate Action Initiative for Agriculture. She will be meeting with representatives of the OKCGA, BCFGA and Grape Growers Assn in Kelowna on September 19th. Potentially the OKCGA may be able to receive technical assistance to assess our sector and farm practices and help prioritize potential improvements. The BCAC has already submitted a response to the initial proposals for handling carbon emission offsets under the new Pacific Carbon Trust. This is a fast moving new area of government policy development which we need to pay attention to. Please contact Christine Dendy christine@dendy.ca if you have an interest in working on this issue. The OKCGA website will be used to provide information and updates.

R&D Tax Credits

Our annual filing for Scientific Research and Development Tax Credits was completed and submitted with our tax return in June. Letters for the individual flow-through tax credits should be in the mail by the end of September for research levies contributed in 2006. Thanks again for your valued contributions to our industry!

Request for Co-operators in a Phenology Study

PARC Summerland, is initiating a 3-4 year study in the Okanagan Valley developing a phenological model for sweet cherry, apple and grapes and are asking for your help in allowing us to collect temperature and phenological data from your orchard. The long term objective of the study is to predict the suitability of sites for fruit and grape production. Your site would be part of a valley-wide network of small temperature sensors looking at the relationship of temperature, bud/fruit development and dormancy. We are looking for growers with either Santina or

Sweetheart cherries. We are also interested in participants with apple (Gala, Granny Smith) and grape (Merlot) sites.

If you agree to participate we will visit your orchard in the next two weeks to flag five trees for observation in the upcoming study and to install temperature sensors at 1-2 locations. They will be installed at shoulder height on a post or a tree. The sensors with the weather shield are about the size of a football.

The data gathered from your orchard would be shared with you at the end of the study period if requested. Access to the sensor sites would be required in order to download the data and monitor the bud and fruit development on a weekly-biweekly basis during the year (March-October) and the research will be ongoing for 3-4 years.

Please let us know if you would like more information or would like to meet to discuss your participation.

Thank you for your consideration.

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Don't forget to check our website from time to time for cherry industry news and upcoming events, newsletters, and research papers. www.bccherry.com