

## **CURRICULUM VITAE**

Christopher Brian Watkins

**Present position:** Director, Cornell Cooperative Extension, Associate Dean for Colleges of Agriculture and Life Sciences and College of Human Ecology, and Professor, Postharvest Science

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### **Education**

1981-1985

PhD: Rutgers - The State University of New Jersey.

1976-1978

MSc, first class honors: University of Auckland, New Zealand.

1973-1976

BSc: University of Auckland, New Zealand.

### **Professional experience**

2014 to present

Director, Cornell Cooperative Extension, and Associate Dean for College of Agriculture and Life Sciences, and College of Human Ecology.

2004 to present

Professor, Postharvest Physiology, Department of Horticulture, Cornell University.

2006 to 2014

Associate Director, Cornell Cooperative Extension, Agriculture and Food Systems.

1994 - 2003

Associate-Professor, Postharvest Physiology, Department of Horticulture, Cornell University.

1985 - 1994

Science manager (1986 onwards) and scientist in the Postharvest Science Group of The Horticulture and Food Research Institute of New Zealand,

	Auckland (formerly the Division of Horticulture and Processing, 1985-1990, and DSIR Fruit and Trees, 1990-1992.
1981-1985	Graduate student in Department of Horticulture and Forestry at Rutgers University, NJ, USA supported by a New Zealand National Research Advisory Council fellowship.
1978-1981	Scientist in the Postharvest Physiology and Storage Section of the Division of Horticulture and Processing, DSIR.

### **Research Focus**

My research program is focused on storage and ripening from both applied and fundamental aspects. A primary area is the development of knowledge required for use of 1-methylcyclopropene (1-MCP), a new ethylene-binding inhibitor that extends the storage life of apples. This work is now being extended to preharvest 1-MCP applications. I also conduct research on new cultivars of importance to New York growers, on the effects of postharvest techniques on the nutritional quality of fruit, and to better understand the underlying mechanisms in fruit responses to storage conditions such as temperature, atmosphere, and 1-MCP, and the interaction of these factors with the development of storage disorders. Current projects focus on the development of physiological disorders of apples such as internal browning, external carbon dioxide injury and superficial scald.

### **Outreach and Extension Focus**

I am responsible for developing and conducting the harvest maturity management, postharvest handling, and storage technology component of the multidisciplinary statewide fruit Extension program. I work in cooperation with Extension faculty in various departments, regional fruit specialists, extension educators, storage operators, and marketers in development, conduct, and evaluation of the Extension program.

### **Graduate School Affiliation**

2001-	Horticulture
1995 -	Food Science and Technology
1994 -2001	Pomology

### **Honors and Awards**

2018	CALS Alumni Outstanding Faculty Award
2016	B.Y. Morrison Lecture invitee, American Society for Horticultural Science
2015	Fellow, American Society for Horticultural Science
2013	Herman M. Cohn Professor of Horticulture
2013	The George Goodling Memorial lecture, State Horticultural Society of Pennsylvania
2010	Crystal Apple - Award of the Director of the Szczepan Pieniazek Research Institute of Pomology and Floriculture, Skierniewice, Poland.
2006	Chairman of the Gordon Conference on Postharvest Physiology.
2005	ASHS Outstanding Extension Educator Award.
2003	The 2003 Award for Excellence to the NE 103 Technical Committee by the Northeastern Regional Association of State Agricultural Experiment Station Directors.
2002	Vice-Chairman of the Gordon Conference on Postharvest Physiology.
1992	Trimble Agricultural Research Fund: Three month research project at University of Massachusetts.

- 1988 Winston Churchill Memorial Trust Fellowship: Six month project at University of Nottingham, England.
- 1981 National Research Advisory Council fellowship for PhD studies at Rutgers.
- 1978 First class honors for MSc.

### **Membership of Professional Societies**

- 1981 - American Society of Horticultural Science, member of Postharvest working group.
- 1981 - American Society of Plant Biologists
- 2003- Institute of Food Technologists
- 1986 - 1996 NZ Institute of Horticultural Science
- 1986 - 1996 NZ Institute of Agricultural Science
- 1996 - American Association for the Advancement of Science.

### **Professional Society Responsibilities**

- Chair, International Society for Horticultural Science Commission Quality and Postharvest Horticulture, 2014-2022.
- ASHS Extension Division Vice President, 2018-2020.
- ASHS Postharvest working group: Secretary 1997-1998 and Chairman, 1998-1999.
- ASHS Member of the committee for the Outstanding Fruit Publication Award, 2000.

### **Departmental, College and University Service**

- 2016- Mentoring committee member (Chair) for Greg Peck
- 2014- New York Sea Grant Institute Board of Govenors.
- 2011- Graduate admissions committee, Horticulture.
- 2010 Ad Hoc promotion and tenure committee.
- 2007-2012 Mentoring committee member (Chair) for Neil Mattson.
- 2002 - 2006 College Faculty Financial Advisory
- 2002 - 2006 University Library Board
- 2002 - 2005 Apple strategic planning task force (chaired by Jim Hunter and Terence Robinson).
- 2005 Ad Hoc promotion and tenure committee.
- 2002 - 2005 Mentoring committee member for Susheng Gan.
- 2001 - Fruit PWT executive member.
- 2002 Ad Hoc promotion and tenure committee.
- 1999 Search committee – Pomologist, Department of Horticultural Sciences, Hudson Valley Laboratory.
- 1999 - 2000 Acting Co-Chair, Statewide Planning Council, Fruit.
- 1998 Search committee - Fruit and Vegetable Process Engineer, Food Science and Technology.
- Search committee - Extension Associate for Horticultural Product Marketing, ARME.
- 1997 - 2000 Department Senator on CALS Senate.
- 1996 - 1997 Search committee - Postharvest Extension Agent, Lake Ontario Fruit team.
- 1996 - Member of the Institute of Food Science.
- 1995 - 2000 Departmental representative on the Food Science and Nutrition Council.
- 1995 - 2001 Apple Crop Germplasm Committee.

### **Editorial Responsibilities**

2016 to present	Associate Editor, Postharvest Biology and Technology.
2013 -2017	Associate Editor, Horticulture Research.
1993 -2011	Editorial Board member, Postharvest Biology and Technology.
1999 - 2004	Associate Editor, HortScience (Postharvest: temperate fruits).
2013-2016	Editorial Advisory Board, Encyclopedia of Applied Plant Sciences

Ad hoc reviewer of manuscripts for the International Journal of Food Science and Technology, Journal of the American Society of Horticultural Science, HortScience, HortTechnology, Journal of Experimental Botany, Annals of Applied Biology, Journal of Genetics, Journal of Horticultural Science and Biotechnology, New Zealand Journal of Crop and Horticultural Science, Postharvest Biology and Technology, Journal of the Science of Food and Agriculture, Journal of Food Science, Plant and Cell Physiology, Plant Physiology and Biochemistry, Journal of Food Processing and Preservation, Lebensmittel-Wissenschaft und –Technologie (LWT), Journal of Texture Studies, Journal of Tree Fruit Production, Botany, Physiologia Plantarum, Scientia Horticulturae, Plant Physiology, Molecular Biology Reports, Fruits, Journal of Plant Physiology, ASHRAE Refrigeration Handbook, Commodity Storage Manual (The Refrigeration Research and Education Foundation).

### **Graduate Students**

#### ***Graduate majors - current***

Kalenga Banda, PhD, 2020, Horticulture  
Yiyi Zhang, PhD, 2019, Horticulture  
Shiding Tsai, MS, 2021, Horticulture

#### ***Graduate majors - completed***

Gilang Sutano, MS, 2016, Food Science  
Yiyi Zhang, MS, 2016, Horticulture  
Franziska Doerflinger, PhD, 2015, Horticulture  
Yiyi Zhang, MPS, 2014, Food Science  
Jin-Wook Lee, PhD, 2011, Horticulture  
Rujira Deewatthanawong, PhD, 2010, Horticulture  
Fanjaniaina Razafimbelo, PhD, 2008, Horticulture  
Adirek Rugkong, PhD, 2008, Horticulture  
Monica Ponce-Valadez, PhD, 2007, Horticulture  
Youngjae Shin, PhD, 2007, Food Science  
Irene Kadzere, PhD, 2005, Horticulture  
Beatriz Calderon Lopez, MS, 2003, Food Science  
Jenny Zhang, PhD, 2003, Horticulture  
Gurbuz Gunes, PhD, 2001, Food Science  
Hongjing Xia, MS, 2001, Horticulture  
Maria Elisa Garcia-Martino, MS, 1998, Food Science  
Jenny Zhang, MS, 1997, Horticulture  
Debra Dawson, PhD, 1993  
Mette Larsen, PhD, 1993

### ***Graduate minors – current***

#### ***Graduate minors - completed***

Cuong Nguyen, PhD, 2014, Plant Biology  
Yaxin Wang, MS, 2014, Horticulture  
Younghua He, PhD, 2012, Horticulture  
Niilante Amissah, PhD, 2010, Food Science  
Greg Peck, PhD, 2008, Horticulture  
Susan Liou, PhD, 2006, Horticulture  
Sami El-Rakshy, PhD, 2005, Horticulture  
Elizabeth Fox, PhD, 2005, Plant Biology  
Garry Legnani, PhD, 2004, Horticulture  
Daniel Sanchez, MS, 2004, Food Science  
Niilante Amissah, MS, 2003, Food Science  
Guy de Capdeville, PhD, 2002, Plant Pathology  
Melanie Budiman, MS, 1998, Biological Engineering  
Sukwon Kang, PhD, 1996, Biological Engineering

#### **External Examiner**

Kim Buts, PhD, Katholieke Universiteit, Leuven, Belgium, 2017.  
Yeo Wei Keat, PhD, University of Nottingham, Malaysia, 2016.  
Siti Khadijah Abdul Karim, PhD, University of Auckland, 2015.  
Yongxin Li, PhD, The University of Newcastle, Australia, 2015.  
Dagar Anurag, PhD, The Hebrew University of Jerusalem, Israel, 2013.  
Inge Bulens, PhD, Katholieke Universiteit, Leuven, Belgium, 2012.  
Sarah Pilkington, PhD, University of Canterbury, Christchurch, New Zealand, 2012.  
Tan Van Pham, PhD, University of Sydney, NSW, Australia, 2008.  
Penta Pristijono, PhD, University of Newcastle, NSW, Australia, 2007.  
Paul East, PhD, Massey University, New Zealand, 2006.  
David R. Harris, PhD, University of Newcastle, Australia, 2004.  
Jason Johnston, PhD, Massey University, New Zealand, 2001.  
John Golding, PhD, University of Western Sydney, Australia, 1999.  
Jennifer DeEll, PhD, University of Guelph, Canada, 1996.  
Ben Dadzie, PhD, Massey University, New Zealand, 1992.  
Elizabeth Lee, MSc, Macquarie University, Australia, 1990.

#### **International Speaking Invitations**

**2018**

New Zealand, February 22: ‘Postharvest challenges of new apple cultivars in Upstate New York’. Plant and Food Research Seminar Series, Auckland.  
Greece, June 5: ‘To infinity (1-methylcyclopropene) and beyond!’ The XI International Symposium on the Plant Hormone Ethylene, June 2-6, Chania, Crete.

- Germany, July 23-August 3: ‘Fruit ripening, maturation and control strategies’. ‘Fruit metabolism’. Fruit CRISP Summer School, Stuttgart and KOB, Lake Constance.
- 2017** Germany, February 7: ‘Postharvest handling practices for better quality and longer shelf life’. 10<sup>th</sup> International FRUITIC Symposium, Fruit Logistica, Berlin.  
Germany, February 10: ‘Big data ’omic approaches to detecting metabolism of fruit disorders’, in Big Data – from cloud to the field, Fresh Produce Forum, Fruit Logistica, Berlin.  
Belgium, March 9: ‘Factors affecting commercial adoption of new postharvest technologies’. Katholieke Universiteit Leuven.  
Poland, June 18: ‘Physiological disorders of apples in a world of 1-methylcyclopropene and controlled atmosphere storage’, XII International Controlled and Modified Atmosphere Research Conference, Warsaw  
Spain, June 17: ‘Managing stem end flesh browning, a new physiological disorder of ‘Gala’ apples’, VI Postharvest Unlimited, Madrid.  
Spain, June 17: ‘Using the DA meter to explore relationships between apple fruit maturity and physiological disorder incidence’, VI Postharvest Unlimited, Madrid.  
Korea, September 12: ‘Factors affecting adoption of new technologies for storage of horticultural products’, IV Asia Symposium on Quality Management in Postharvest Systems, Jeonju.
- 2016** Spain, June 23: ‘New technologies for storage of horticultural products: more than availability!’ VIII International Postharvest Symposium, Cartagena, June 21-24.  
Turkey, October 4: ‘Latest scientific developments in the field of post harvest technology of horticultural crops’. Seventh National Symposium on Cold Storage and Marketing of Horticultural Crops, Isparta.  
China, October 13: ‘Preharvest and postharvest 1-MCP application on fruit quality and physiological disorders’. 1<sup>st</sup> International Apple Symposium, Yangling, Shaanxi, October 10-16.
- 2014** Australia, August 21: ‘Pre- and post-harvest inhibition of ethylene production and action by 1-MCP and the quality of apples and other horticultural products’. 29<sup>th</sup> International Horticultural Congress, Brisbane, August 17-22.  
China, October 17: ‘Revealing the role of ethylene in development of physiological disorders of fruits and vegetables with the use of 1-methylcyclopropene (1-MCP)’. International Horticulture Research Conference, Nanjing, October 14-18.
- 2013** Australia, December 5: ‘Understanding the mechanisms in fruit response to various storage conditions’ and ‘Storage disorders – can they be predicted with precise and timely diagnostics?’ Postharvest Cool Store Seminar, Melbourne.  
China, October 21 and 22: ‘Maximizing the best of 1-MCP application to apples and other fruit, while minimizing the negative’ and ‘Development of CA storage and latest innovations’. Nanjing Agricultural University.  
England, September 3: ‘Maximizing the responses of apple fruit to 1-MCP to enhance the best and minimize the worst’. VI International Postharvest Conference. Managing Quality in Chains, Cranfield University, September 2-5.  
Turkey, April 29: ‘Insights into physiological disorders of horticultural products revealed by 1-methylcyclopropene (1-MCP)’. 2<sup>nd</sup> International Symposium on Discovery and Development of Innovative Strategies for Postharvest Disease

- Management, Kusadasi, April 28-May 2.
- 2012** New Zealand, March 22: 'Pre- and post-harvest uses of 1-MCP as a tool to investigate ethylene responses in fruit'. The IXth International Conference on the Plant Hormone Ethylene, Rotorua, March 19-23.
- Korea, June 12: 'Pre- and post-harvest 1-MCP on quality of apples'. Korean Horticulture Society, Daegu.
- Spain, October 1: 'Effect of 1-MCP on apple fruit physiological disorders'. Genomic and metabolomic approaches. X Simposio Nacional y VII Ibérico sobre Maduración y Postcosecha de Frutas y Hortalizas, Lleida, October 1-4.
- Belgium, December 13: 'The American experience using SmartFresh™ on pipfruit'. Katholieke Universiteit, Leuven, Belgium.
- 2011** Canada, February 24: 'Updates on McIntosh and Empire apple storage'. Ontario Fruit & Vegetable Convention, Brock University, St. Catherines, Ontario.
- Canada, April 13: 'Drop control program's influence on storage quality'. AgroFresh Crunch Clinic, Montreal, Quebec.
- Canada, April 13: 'Carbon dioxide injury control'. AgroFresh Crunch Clinic, Montreal, Quebec.
- Canada, April 13: 'Experiences with repeated SmartFresh applications'. AgroFresh Crunch Clinic, Montreal, Quebec.
- China, June 28: 'Managing ethylene before and after harvest'. Chinese Agricultural University, Beijing.
- China, July 1: 'Managing ethylene before and after harvest'. Beijing Forestry Institute, Beijing.
- Australia, September 21: '1-MCP and apples – a marriage made in heaven, with a few rough patches!' Australasian Horticulture Society, Lorne, Victoria.
- China, October 27: 'Insights into physiological disorders of horticultural products revealed by 1-methylcyclopropene (1-MCP)'. International Workshop on Biology of Fruit Quality', Hangzhou.
- China, November 21: 'Using 1-MCP to manage fruit quality, especially apples'. Chinese Academy of Agricultural Sciences (CAAS), Xingcheng.
- 2010** Canada, May: 'Managing CO<sub>2</sub> injury in McIntosh and other cultivars'. AgroFresh Crunch Clinic, Kelowna, BC.
- Poland, May: 'The effects of pre- and post-harvest 1-MCP treatment on quality of fruits and vegetables'. Skierniewice.
- Canada, November: 'Harvista and ReTain interactions with storage of Honeycrisp apples grown in three regions of New York'. Great Lakes fruit Worker Meeting, Leamington, Ontario.
- 2009** Turkey, April: Postharvest 2009, Antalya.
- Canada, May: 'Control of internal browning, carbon dioxide injury, and Harvista technology research update'. AgroFresh Crunch Clinic, Toronto.
- New Zealand, November: Postharvest Pacifica, Napier.
- 2008** Israel, March: COST Action 924, Tel Aviv.
- Greece, November: Departmental seminars, Athens.
- 2007** Germany, November: COST Action 924, Ravensburg.
- 2006** Italy, June: Ethylene 2006, Pisa.
- Korea, August: International Society for Horticultural Science, Seoul.
- China, August: International Apple Symposium, Yantai; Northwestern University, Yangling; Chinese Agricultural University, Beijing.

- 2005** Canada, September: Ontario Apple School, Norfolk.  
**2005** Sultanate of Oman, January: Postharvest Technology & Quality Management in Arid Tropics.
- 2004** Canada, February: Ontario Fruit and Vegetable Conference, St. Catherines.  
Italy, June: Postharvest 2004, Verona.  
Australia, November: Postharvest Downunder, Sydney.
- 2003** Thailand, August: APEC Symposium on Postharvest Handling Systems, Bangkok.
- 2002** Spain, April: NATO workshop on ethylene, Murcia.  
India, July: Cornell Agribusiness Conference, Pune.
- 2000** Israel, March: Postharvest 2000, Jerusalem.  
Canada, July: Apple storage school, Clarksburg, Ontario.
- 1999** Canada, February: Forum sur la concertation en recherche et transfert technologique du secteur de la production horticole au Quebec.  
China, October: International Symposium and Exhibition on Fruit/Vegetable Processing Technology and Industrialization, Yantai.  
South Korea, October: Korean Society of Postharvest Science and Technology of Agricultural Products, Yeungnam University, Taegu.
- 1997** Israel, March: International Congress on the Uses of Plastics in Agriculture, Tel Aviv.  
Canada, February: Apple Growing Information Day, St-Hyacinthe Agricultural Technology Institut, Quebec.
- 1996** New Zealand, August: Controlled Atmosphere Storage workshop, Hastings.
- 1995** Chile, October: To present two papers on calcium research, to advise growers, and to review the postharvest research program at University of Talca.
- 1993** Malaysia, November: IILP International Symposium and Workshop on Commercial Production of Fruit, Vegetables and Flowers, Universiti Pertanian.  
USA, March: International Symposium on Storage Scald and the 9th Annual Washington Tree Fruit Postharvest Conference, Wenatchee, WA,

### **National Speaking Invitations**

- 2016** February 2: ‘Three years of storage research on Pennsylvania Honeycrisp – Implications for growers and packers’. Mid-Atlantic Fruit and Vegetable Convention, Hershey, Pennsylvania.  
February 3: ‘The continuing quest for optimal harvest management & storage of apples’. Mid-Atlantic Fruit and Vegetable Convention, Hershey, Pennsylvania.
- 2015** August 5: ‘Postharvest losses: Emerging technologies to mitigate’. ASHS National Meeting, New Orleans, Louisiana
- 2014** August 6: ‘Honeycrisp storage’. MSU CA Storage Clinic, Belmont, Michigan.  
August 6: ‘CO<sub>2</sub> injury/scald control without DPA’. MSU CA Storage Clinic, Belmont, Michigan.  
August 6: ‘Experiences with the DA meter’. MSU CA Storage Clinic, Belmont, Michigan.  
August 6: ‘Will advances in stress sensing make safe ultra-low O<sub>2</sub> CA storage possible?’ MSU CA Storage Clinic, Belmont, Michigan.  
December 3: ‘Harvest management via maturation manipulation’. Washington State Horticulture Society, Kennewick, Washington.  
December 3: ‘Storage management to optimize packouts and eating quality’ (Panel member), Washington State Horticulture Society, Kennewick, Washington.



- 2013** January 29: ‘Use of SmartFresh on different apple varieties’. Mid-Atlantic Fruit and Vegetable Convention, Hershey, Pennsylvania.  
March 1: ‘1-MCP and the apple fruit: applied and basic aspects’. Department of Plant Biology and Pathology, Rutgers, New Jersey.  
May 7: ‘DPA use with 1-MCP’. Pace International Postharvest Academy, Ellensburg, Washington.
- 2012** Dec 5: ‘Why is Honeycrisp so tricky?’ Washington State Horticulture Show, Yakima, Washington.  
Dec 5: ‘Carbon dioxide injury of apples’. Washington State Horticulture Show, Yakima, Washington.
- 2011** May 26: ‘Managing ethylene for storage of horticultural products’. Postharvest Unlimited, Leavenworth, Washington.
- 2010** March: ‘The role of ethylene both pre- and postharvest on apple responses to 1-MCP’. 53<sup>rd</sup> IFTA Conference, Grand Rapids, Michigan.  
March: ‘Bitterpit development and control, especially in Honeycrisp’. 53<sup>rd</sup> IFTA Conference, Grand Rapids, Michigan.  
March: ‘1-MCP effects on physiological disorders’. 53<sup>rd</sup> IFTA Conference, Grand Rapids, Michigan.  
June: 1-MCP effects on physiological disorders. Gordon Conference on Postharvest Physiology, GRC, New Hampshire.  
July: ‘Recent Honeycrisp research’. AgroFresh Crunch Clinic, Hershey, Pennsylvania.
- 2009** May: ‘Honeycrisp maturity and storage – the east coast experience’. Washington State University Fruit School, Ellensburg, Washington.  
May: ‘Controlling carbon dioxide injury and flesh browning’. Washington State University Fruit School, Ellensburg, Washington.  
June: ‘Control of bitter pit and carbon dioxide injury’. Crunch Clinic, Grand Rapids, Michigan.  
August: ‘Current and future research and uses of 1-MCP on apples’. National Growth Regulation Society, Asheville, North Carolina.
- 2008** January: ‘Managing bitter pit’. Indiana Horticulture Congress, Indianapolis, Indiana.  
January: ‘Harvista – A new tool for harvest management’. Indiana Horticulture Congress, Indianapolis, Indiana.
- 2007** February: ‘Reviews on 1-MCP’, AgroFresh Apple Camp, Wilkes Barre, Pennsylvania.  
March: ‘Harvista, a new tool for the NE apple industry’, NE Horticulture Society, Sturbridge, New Hampshire.  
March: ‘Postharvest handling of vegetables to maintain quality’, NE Horticulture Society, Sturbridge, New Hampshire.  
November:
- 2006** March: ‘Postharvest delivery of high quality product to consumers’ and ‘Managing Honeycrisp apples’, International Tree Fruit Association, Hershey, Pennsylvania.  
June: ‘Pre- and post-harvest handling for maximum response to SmartFresh (1-MCP)’, AgroFresh Apple Camp, Atlantic City, New Jersey.  
June: ‘Effects of SF on storage disorders’, AgroFresh Apple Camp, Atlantic City, New Jersey.

- 2005** August: 'Browning disorders in apple fruit'. Fruit Quality Workshop, Yakima, Washington.  
August: 'Honeycrisp maturity and storage'. Fruit Quality Workshop, Yakima, Washington.
- 2004** August: 'Control of storage disorders of Honeycrisp' and 'New York perspective on 1-MCP'. MSU CA Clinic, Clarksville, Michigan.
- 2003** December: 'The potential of 1-MCP for eastern apple industries'. Great Lakes Fruit, Vegetable & Farm market Expo, Michigan.
- 2001** January: 'Update on MCP'. New England Fruit Meetings, Massachusetts.
- 2000** January: 'Storage physiology 101 – fundamentals of product response to CA', and 'Effects of packing, cooling, and transport'. Vermont Fruit Quality Fruit School, Killington, Vermont.
- 1999** January: 'What can we learn for the New Zealand apple industry', and 'Harvest and postharvest handling of fruit – issues for the apple industry'. Virginia and West Virginia Horticultural Societies Meeting, Roanoke, West Virginia.
- 1998** July: 'Harvest and Storage Management for High Quality Fruit'. University of Massachusetts Extension Storage School, Belchertown, Massachusetts.
- 1997** January: 'Harvesting, handling and storage for fruit quality'. 1997 Kansas Fruit Growers Annual meeting, Kansas.
- 1996** October: 'Are the effects of heat treatments on physiology due to heat shock proteins?' Workshop at ASHS Annual Meeting, Lexington, Kentucky.
- 1995** April: 'Maturity and storage considerations for 'Gala' and 'Fuji'. Controlled Atmosphere Storage and Warehousing Clinic, Michigan State University, Michigan.

### **Statewide Speaking Invitations**

- 2016** January 19: 'Apples of the world' panel, Empire State Producers Expo, Syracuse.  
March 29 and 30: '1-MCP basics and history', 'Basic fruit physiology and ripening', 'Honeycrisp and bitterpit', 'Internal browning on Gala & Empire'. Apple Quality Management Summit, AgroFresh, Verona.
- 2015** January 20: Towards optimizing harvest timing, prestorage conditioning, and postharvest handling of Honeycrisp, Empire State Producers Expo, Syracuse.  
February 2: 'The DA meter – a magic bullet for harvest decisions, or just hype?' Western New York Tree Fruit School, Lockport.  
February 3: 'The DA meter – a magic bullet for harvest decisions, or just hype?' Western New York Tree Fruit School, Newark.  
February 9: 'The continuing quest for optimal harvest management and storage of apples', and 'CCE and ENYCHP updates and outlook'. Northeastern NY Commercial Tree Fruit School.  
February 10: 'The continuing quest for optimal harvest management and storage of apples', and 'The Eastern New York Commercial Horticulture Program, How is it different, and better?', Hudson Valley Commercial Fruit Growers' School, Kingston.
- 2014** February 12: Post-harvest issues in NY apples – an update', Hudson Valley Commercial Fruit Growers' School, Kingston.
- 2013** January 22: 'Keys to early success with NY1 and NY2', Empire State Producers Expo, Syracuse [84].  
April 9: 'Harvest New York', Alpha Zeta's National Agricultural Leadership

- Conference, Ithaca.
- 2012** January 24: ‘Regional and harvest date relationships with storage quality of Honeycrisp apples’, Empire State Fruit and Vegetable Expo, Syracuse.
- 2011** January 26: ‘Effect of stop drop materials on storage quality’, Empire State Fruit and Vegetable Expo, Syracuse.
- 2010** January: ‘Honeycrisp maturity and storage’, Western New York Tree Fruit School, Newark and Orleans.
- 2009** February: ‘Harvista – stop drop and storage effects on NY varieties’, Empire State Fruit and Vegetable Expo, Syracuse.  
February: ‘Harvest and storage for high quality strawberries’, Empire State Fruit and Vegetable Expo, Syracuse.  
February: Update on Harvista and storage protocols for McIntosh, Upper Hudson and Champlain Tree-Fruit School, Lake George.  
March: Postharvest physiological disorders and mineral nutrients, March 24 in Ballston Spa, (March 24) and Newark (March 25)  
August: Cornell University and sustainability, Finger Lakes Sustainable Farming Center Conference (August 19)
- 2008** January: ‘Update on harvest and handling of apples -2007 and beyond’, Western New York Tree Fruit School, Newark and Orleans.  
February: ‘Harvista - a new tool for harvest management’, Empire State Fruit and Vegetable Expo, Syracuse.  
February: ‘Innovative pre-harvest use of 1-MCP in apple orchards’, Upper Hudson and Champlain Tree-Fruit School, Lake George.  
February: ‘Controlling bitter pit’, Hudson Valley Fruit School, Kingston.  
April: ‘SmartFresh and Harvista updates’, AgroFresh Crunch Clinic, Buffalo.  
June: ‘Postharvest principles’, Cornell Agribusiness program, Ithaca.  
August: ‘Initiatives at Cornell University to research and promote agricultural sustainability’, Creative Agriculture – Approaches to Sustainability on the Farm, Canandaigua.
- 2007** January: ‘Growing and selling healthy food: exploring the latest in production and postharvest handling’, Direct Marketing Conference, Owego  
March: ‘Postharvest handling for better quality and food safety’, Community Markets Vendor meeting, Cold Spring.  
March: ‘Controlling storage disorders’, Hudson Valley Fruit Grower School, Kingston.  
March: ‘Postharvest handling of vegetables’, Southeast Vegetable/Onion School, Newburg.  
June: ‘Is Harvista a reality for New York?’, Premier Apple Forum, Syracuse.  
November: ‘Postharvest technologies for direct marketing – reinforcing the message’, Strategic Marketing Workshop, Hyde Park.
- 2006** January: ‘Managing bitter pit to improve apple quality’, Western New York Tree Fruit School, Newark and Orleans.  
February: ‘SmartFresh for the Hudson Valley’, Hudson Valley Fruit Grower School, Kingston.  
March: ‘Making 1-MCP work for NY’, Upper Hudson and Champlain Tree-Fruit School, Lake George.  
November: ‘Postharvest technologies for direct marketing’, Beyond growing – strategies and technologies that transform your products to meet market demand,

- Strategic Marketing Workshop, Hyde Park.
- 2005** June: The future of 1-MCP for the New York apple industry. Premier Apple Forum, Syracuse.
- 2004** February: 'What we know about 1-MCP', New York Agriculture and Markets Inspector Training, Verona.  
February: 'The impact of 1-MCP on future planting decisions', New York Expo, Rochester.  
March: 'What we know about 1-MCP', New York Agriculture and Markets Inspector Training, Verona.
- 2003** February: 'Update on maturity and storage of Honeycrisp', Western New York Tree Fruit Schools, Newark and Orleans.  
March: 'Calcium Nutrition and Control of Ca-related Disorders'. In-depth Fruit School Apple Mineral Nutrition, Ballston Spa, and Albion
- 2002** January: '1-MCP: It's Effects On Fruit Quality In And Out Of Storage'. Western New York Tree Fruit Schools, Medina and Newark.  
February: '1-MCP effects on fruit quality'. Hudson Valley Fruit School, Kingston;  
February: '1-MCP effects on fruit quality' and 'What we have learned about 'Honeycrisp', Upper Hudson and Champlain Tree-Fruit School, Lake George.
- 2001** August: 'Postharvest GAPs for Apples'. Good Agricultural Practices (GAPs) Workshop on Cabbage and Apples for NYS Department of Agriculture and Markets Farm Inspectors, Geneva.
- 2000** June: 'CA storage of McIntosh' and 'Storage of Honeycrisp'. International Dwarf Fruit tree Association Summer tour, Champlain.
- 1999** January: 'Harvesting and handling of sweet cherries'. Annual Meeting of the New York Horticultural Society, Rochester.  
February: 'Temperature variation and fruit quality: the carton-pack-out connection'. Upper Hudson and Champlain Tree-Fruit School, Lake George.  
February: 'Postharvest Physiology 101' (with A. Rangarajan). New York State Vegetable Conference, Syracuse.  
February: 'The handling and storage of Fuji, Gala and other new varieties'. Hudson Valley Commercial Fruit Growers School, Kingston.
- 1998** February: 'Issues in post harvest and controlled atmosphere storage'. Upper Hudson and Champlain Tree-Fruit School, Lake George.  
March: 'Optimizing your efforts: post harvest handling of small fruit'. Eastern New York 1998 Commercial Small fruit School, Latham.
- 1997** January: 'Postharvest research and extension needs for New York'. Annual Meeting of the New York Horticultural Society/1997 Western New York Tree Fruit School, Rochester.  
February: 'Maintaining quality of Empire apples'. Hudson Valley Fruit School, Kingston.
- 1996** January/February: 'Tackling the wholesale fruit market - Approaching the buyer, Keeping them happy, Postharvest handling'. Member of panel discussions at Berry School # 1, Hort. Show, Rochester, January 11, and Berry School # 2, North American Farmers Direct Marketing Conference, Saratoga Springs, February 22.  
February: 'Calcium and fruit quality', presented at the following Fruit Schools Kingston, February 7, Plattsburg, February 8, Ballston Spa, February 9, and two in Western New York, February 23 and 24.

- 1995**     January: 'Storage of 'Bosc' pears with and without apples'. New York Pear Growers Association, HortShow, Rochester.  
January: 'Postharvest handling of strawberries (and how to build a precooler)'. New York Berry Growers Association, Tully.  
March: 'Apple disorders: the ins and outs'. CCE Northeast New York Area Fruit Program, Plattsburg, March 22, and Ballston Spa, March 23.  
August: 'Postharvest fruit handling'. Hudson Valley Growers' Preharvest Meeting, Kingston.
- 1994**     September: 'Maturity and controlled atmosphere recommendations', Champlain, Hudson Valley, Western New York (x2).  
November: 'New Zealand experience with Gala, Braeburn, and Fuji apples. Production agriculture inservice education week.

### **Storage workshops**

- 2017**     Storage workshop, Hudson Valley (August 24), Champlain (August 20), Western New York (August 28).
- 2015**     Storage workshop: Champlain (August 20), Hudson Valley (August 24), Western New York (August 28).
- 2013**     Storage workshop: Ithaca, August.
- 2012**     Preharvest workshop: Western New York, August.
- 2011**     Storage workshop: Ithaca, August.
- 2010**     Preharvest workshop: Hudson Valley, Western New York, August.
- 2009**     Storage workshop: Ithaca, August.
- 2008**     Preharvest workshop: Peru, Hudson Valley, Western New York, September.
- 2007**     Storage workshop: Ithaca, August.  
Preharvest workshop: Hudson Valley, Western New York, August.
- 2006**     Storage workshop: Peru, Hudson Valley, Western New York, September.
- 2005**     Storage workshop: Ithaca, Hudson Valley, Western New York, August.
- 2004**     Storage workshop: Hudson Valley, Peru, Western New York, August.
- 2003**     Storage workshop 2003, Ithaca, July.
- 2002**     Storage workshop: Hudson Valley, Peru, Western New York, August.
- 2001**     Storage workshop 2001, Ithaca, August.
- 2000**     Storage workshop: Hudson Valley, August; Peru, August
- 1999**     CA Storage: Meeting the market requirements, Ithaca, August.
- 1998**     Storage workshop: Hudson Valley, August; Peru, August; Western New York, September.
- 1997**     Harvesting, handling, and storage workshop, Ithaca, August.
- 1996**     Storage workshop: Hudson Valley, July; Western New York, August; Peru, September.

### **University seminars**

- 2016**     'Challenges and Opportunities for Cornell Cooperative Extension.' Horticulture section, School of Integrative Plant Science, Ithaca, October 31.
- 2015**     'Apple World – Challenges and new technologies. A postharvest perspective!' Plant Pathology section, School of Integrative Plant Science, Geneva
- 2007**     'Action and uses of 1-MCP on food crops', Department of Food Science, January

- 30.
- 2005** 'The potential of 1-MCP for horticultural industries', Department of Horticulture, Ithaca, September 12.
- 2001** '1-Methylcyclopropene (1-MCP), Smartfresh™, a revolution for storage of apples?' Department of Horticulture, Ithaca, October 18.
- 1997** 'Practices, problems and progress in postharvest storage of apples in the Northeast'. Department of Horticultural Science, Geneva, March 24:.  
'A tale of two controlled atmosphere-related disorders'. Department of Fruit and Vegetable Science, Ithaca, April 10.
- 1996** 'Effects of postharvest stress treatments on quality and storage ability of fruit'. Department of Food Science, Ithaca, March 5.  
'Opportunities to enhance nutritional status through improved post-harvest methods'. Food Systems for Improved Health Colloquium, Ithaca, December 16.
- 1995** 'Stressing fruit for fun and profit'. Plant Biology, Ithaca, April 14.
- 1994** 'Forward and retro views'. Department of Fruit and Vegetable Science, Ithaca, December 1.

#### **Consultancies - insurance**

- 2009** Legal assessment and deposition - Damage on Gala apples (Olympic Fruit Company, LLC v. CH2O; Stocker, Smith, Luciani & Staub, WA)  
Legal assessment and deposition – Damage to D’Anjou pears (Diamond Fruit Growers, Inc. v. Pace International, LLC., and United Agriproducts, INC. (Banducci Woodard Schwartzman PLLC, ID)
- 2004** Legal assessment and deposition continuing from 1999 ‘Gala’ damage claim (Cozen and O’Connor, CA)
- 2003** Assessment of apple and pear losses on arrival in US from Chile (Fox Rothschild O’Brien & Frankel, PA).
- 2001** Legal assessment requiring specialist postharvest knowledge: problem with damaged ‘Granny Smith’ apples in California (CNA Commercial Insurance, NY).
- 1999** Legal assessment requiring specialist postharvest knowledge: problem with damaged ‘Gala’ apples in California.
- 1998** Legal assessment requiring specialist postharvest knowledge: problem with damaged ‘Fuji’ apples in California.
- 1996** Legal assessment requiring specialist postharvest knowledge: problem with damaged 'Granny Smith' apples in California.
- 1995** Legal assessment requiring specialist postharvest knowledge: problem with a shipment of bananas from the West Indies to the US.

#### **Overseas consultancies**

- 2017** Training Smallholder Apple Farmers in China for Sustainable Production and Domestic Market Access, Liaoning Province, China, March 26-31. Walmart Foundation Project.
- 2016** Training Smallholder Apple Farmers in China for Sustainable Production and Domestic Market Access, Shandong and Shaanxi Provinces, China, March 10-20. Walmart Foundation Project.
- 2015** Training Smallholder Apple Farmers in China for Sustainable Production and Domestic Market Access, Shandong and Shaanxi Provinces, China, March 8-18. Walmart Foundation Project.

- 2014** Training Smallholder Apple Farmers in China for Sustainable Production and Domestic Market Access, Shandong and Shaanxi Provinces, China, March 1-14. Walmart Foundation Project.
- 2013** Training Smallholder Apple Farmers in China for Sustainable Production and Domestic Market Access, Shandong and Shaanxi Provinces, China, March 4-11. Walmart Foundation Project.
- 2011** Preharvest and Postharvest Needs of the Serbian Apple Industry STTA June 14-17, USAID Serbia Agribusiness Project
- 2010** Postharvest Needs of the Serbian Apple Industry STTA February 15-26, USAID Serbia Agribusiness Project
- 2009** Postharvest Needs of the Serbian Apple Industry with Focus on ULO Storages, STTA February 20-March 6, USAID Serbia Agribusiness Project
- 2002** Agribusiness program in India and visits to industry facilities coordinated by Dr. K. V. Raman, Associate Director, Special Projects.
- 1997** Member of the Postharvest Program Review Committee organized by the New Zealand Foundation for Research, Science and Technology, New Zealand, February.  
World Bank-sponsored visit to advise commercial growers on latest developments in handling and storage of horticultural products, Zimbabwe, November.  
Member of Cornell team which prepared a document for the Brazilian research organization, EMBRAPA, on the future directions for biotechnological research and make recommendations on investment priorities.
- 1996** Member of FAO consultancy team to formulate priorities for research investment in biotechnology of horticultural crops, India, November.

### **Other**

1. 1996-1999, and 2002-2003: Admissions Committee for Field of Food Science and Technology.
2. Appointed as Associate member of the Faculty of Graduate Studies at the University of Guelph, Canada (1996-1998).
3. NE103 regional 'Postharvest physiology of fruit' working group: member of the rewriting committee, 1998.
4. NE1018 regional 'Postharvest physiology of fruit' working group: member of the rewriting committee, 2003.
5. Member of the International Scientific Organizing Committee, VI International Meeting on Biology and Biotechnology of the Plant Hormone Ethylene, Murcia, Spain, April, 2002.
6. Member of the International Scientific Organizing Committee, Postharvest 2004, Verona, Italy.
7. Regularly invited to review promotion packages both nationally and internationally (US, 11; UK, 3; Israel, 7; New Zealand (1); West Indies, 1; Canada, 5; Oman, 1).
8. Member of the International Scientific Organizing Committee, Southeast Asia Symposium on Quality Management in Postharvest Systems (SEAsia2011), Thailand (3-6 December 2011).
9. RosBREED Extension Advisory Panel member, 2009-2018.
10. Member of the Administrative Council, Northeast SARE: 2010 to 2016.
11. Member of the International Scientific Organizing Committee, XI International Controlled & Modified Atmosphere Research Conference Trani, Italy (3-7 June 2013).

12. Member of the International Scientific Organizing Committee, 2nd Southeast Asia Symposium on Quality Management in Postharvest Systems (SEAsia2013), Vientiane, Laos (4-6 December 2013).
13. Member of the International Scientific Organizing Committee, 29<sup>th</sup> International Horticultural Congress, Brisbane, Australia (17-22 August, 2014)



# PUBLICATIONS

## 1. Journal Articles

### *Peer reviewed.*

154. Al Shoffe, Y., Watkins, C.B. 2018. Initial short-term storage at 33 °F reduces physiological disorder development in 'Honeycrisp' apples. HortTechnology. In press
153. Al Shoffe, Y., Shah, A.S., Nock, J.F., Watkins, C.B. 2018. Acetaldehyde and ethanol metabolism in relation to conditioning effects on soft scald development in 'Honeycrisp' apples. HortScience. In press
152. Baugher, T.A., Marini, R., Schupp, J.R., Watkins, C.B. 2017. Prediction of bitter pit in 'Honeycrisp' apples and best management implications. HortScience 52:1368–1374. 2017. doi: 10.21273/HORTSCI12266-17
151. Gapper, N.E., Hertog, M.L.A.T.M., Lee, J., Buchanan, D.A., Leisso, R.S., Fei, Z., Qu, G., Giovannoni, J.J., Johnston, J.W., Schaffer, R.J., Nicolai, B.M., Mattheis, J.P., Watkins, C.B., Rudell, D.R. 2017. Delayed response to cold stress is characterized by successive metabolic shifts culminating in apple fruit peel necrosis. BMC Plant Biology 17:77 doi: 10.1186/s12870-017-1030-6.
150. Mahajan, P., Caleb, O., Gil, M.I., Izumi, H., Colelli, G., Watkins, C.B., Zude, M. 2017. Quality and safety of fresh horticultural commodities: Recent advances and future perspectives. Food Packaging and Shelf Life 14:2-11. doi.org/10.1016/j.fpsl.2017.08.001
149. Leisso, R.S., Gapper, N.E., Mattheis, J.P., Sullivan, N.L., Watkins, C.B., Giovannoni, J.J., Schaffer, R.J., Johnston, J.W., Hanrahan, I., Hertog, M.L.A.T.M., Nicolai, B.M., Rudell, D.R. 2016. Gene expression and metabolism preceding soft scald, a chilling injury of 'Honeycrisp' apple fruit. BMC Genomics 17:798 doi: 10.1186/s12864-016-3019-1.
148. Rickard, B.J., Rudell, D.R., Watkins, C.B. 2016. Ex ante economic evaluation of technologies for managing postharvest physiological disorders: The case of 'Empire' apples in New York State. HortScience 51:537-542.
147. Doerflinger, F.C. Miller, W.B., Nock, J.F., Watkins, C.B. 2015. Variation in zonal fruit starch concentrations of apples: a developmental phenomenon or indicator of ripening? Horticulture Res. 2, 15047; doi:10.1038/hortres.2015.47.
146. Doerflinger, F.C. Miller, W.B., Nock, J.F., Watkins, C.B. 2015. Relationships between starch pattern indices and starch concentrations in four apple cultivars. Postharvest Biol. Technol. 110:86-95.
145. Doerflinger, F.C., Rickard, B.J., Nock, J.F., Watkins, C.B. 2015. An economic analysis of harvest timing to manage a physiological storage disorder in 'Empire' apples. Postharvest Biol. Technol. 107:1-8.
144. Leisso, R.S., Buchanan, D.A., Lee, J., Mattheis, J.P., Sater, C., Hanrahan, I., Watkins, C.B., Gapper, N.E., Johnston, J.W., Schaffer, R.J., Hertog, M.L.A.T.M., Nicolai, B.M., Rudell, D.R. 2015. Chilling-related cell death of apple fruit cortical tissue impacts antioxidant, lipid, and phenolic metabolism (*Malus x domestica* Borkh.). Physiologia Plantarum 153:204-220. doi: 10.1111/ppl.12244.
143. Ma, Y., Lu, X., Nock, J.F., Watkins, C.B. 2015. Peroxidase and polyphenol oxidase activities in relation to flesh browning in stem end and calyx end tissues of 'Empire' apple during controlled atmosphere storage. Postharvest Biol. Technol. 108:1-7.
142. Bowen, J., Ireland, H.S., Crowhurst, R., Luo, Z., Watson, A.E., Foster, T., Gapper, N., Giovannoni, J.J., Mattheis, J.P., Watkins, C., Rudell, D., Johnston, J.W., Schaffer, R.J. 2014. Selection of low-variance expressed *Malus x domestica* (apple) genes for use as quantitative PCR reference genes (housekeepers). Tree Genet. Genomes 10:751-759.
141. Dong, X., Huber, D.J., Ramírez-Sánchez, M., Rao, J., Lee, J., Watkins, C.B. 2014. Cultivar differences in gaseous 1-methylcyclopropene accumulation in whole and fresh-cut apple fruit. Postharvest Biol. Technol. 93:130–134.
140. Gapper, N.E., Giovannoni, J.J., Watkins, C.B. 2014. Understanding development and ripening of fruit crops in an "-omics" era. Horticulture Res. 1:14034; doi:10.1038/hortres.2014.34.
139. Jung, S.K., Watkins, C.B. 2014. Internal ethylene concentrations in apple fruit at harvest affect sensitivity of fruit to 1-methylcyclopropene. Postharvest Biol. Technol. 96:1-6.
138. Madani, B., Mohamed, M.T.M., Watkins, C.B., Kadir, J., Awang, Y., Shojaei, T.R. 2014. Preharvest calcium chloride sprays affect ripening of Eksotika II' papaya fruits during cold storage. Scientia Hort. 171:6-13.

137. Mahajan, P.V., Caleb, O.J., Singh, Z., Watkins, C.B., Geyer, G. 2014. Postharvest treatments of fresh produce. *Phil. Trans. R. Soc. A* 372: 20130309; doi:10.1098/rsta.2013.0309.
136. Mellidou, I., Buts, K., Hatoum, D., Ho, Q.T., Mattheis, J.P., Johnston, J.W., Watkins, C.B., Schaffer, R.J., Gapper, N.E., Giovannoni, J.J., Rudell, D.R., Hertog, M.L.A.T.M., Nicolai, B.M. 2014. Transcriptomic events associated with internal browning of apple during postharvest storage. *BMC Plant Biol.* 14:328 doi:10.1186/s12870-014-0328-x
135. Amissah, J.G.N., Hotchkiss, J.H., Watkins, C.B. 2013. Nitric oxide inhibition of alcohol dehydrogenase in fresh-cut apples (*Malus domestica* Borkh). *J. Agric. Food Chem.* 61:11076-11081. doi:10.1021/jf4021224.
134. Gapper, N.E., Rudell, D.R., Giovannoni, J., Watkins, C.B. 2013. Biomarker development for external CO<sub>2</sub> injury prediction in apples through exploration of both transcriptome and DNA methylation changes. *AoB Plants* 2013; doi: 10.1093/aobpla/plt021.
133. Kweon, H.J., Kang, I.K., Kim, M.J., Lee, J., Moon, Y.S., Choi, C., Choi, D.G., Watkins, C.B. 2013. Fruit maturity, controlled atmosphere delays and storage temperature affect fruit quality and incidence of storage disorders of 'Fuji' apples. *Scientia Hort.* 157:60-64.
132. Lu, X., Nock, J.F., Ma, Y., Liu, X., Watkins, C.B. 2013. Effects of repeated 1-methylcyclopropene (1-MCP) treatments on ripening and superficial scald of 'Cortland' and 'Delicious' apples. *Postharvest Biol. Technol.* 78:48-54.
131. Nock, J.F., Watkins, C.B. 2013. Repeated treatment of apple fruit with 1-methylcyclopropene (1-MCP) prior to controlled atmosphere storage. *Postharvest Biol. Technol.* 79:73-79.
130. Tong, C.B.S., McKay, S.J., Luby, J., Beaudry, R., Contreras, C., Nock, J.F., Watkins, C.B. 2013. Using mixed effects models to estimate the effect of harvest date and its interactions with post-harvest storage regime on apple fruit firmness. *J. Hort. Sci. Biotechnol.* 88:29-36.
129. Harb, J., Gapper, N.E., Giovannoni, J.J., Watkins, C.B. 2012. Molecular analysis of softening and ethylene synthesis and perception pathways in a non-softening apple cultivar, 'Honeycrisp', and a rapidly softening cultivar, 'McIntosh'. *Postharvest Biol. Technol.* 64:94-103.
128. Kou, X., Watkins, C.B., Gan, S.G. 2012. Arabidopsis *AtNAP* regulates fruit senescence. *J. Exp. Bot.* 63: 6139-6147.
127. Lee, J., Cheng, L., Rudell, D.R., Watkins, C.B. 2012. Antioxidant metabolism of 1-methylcyclopropene (1-MCP) treated 'Empire' apples during controlled atmosphere storage. *Postharvest Biol. Technol.* 65:79-91.
126. Lee, S.L., Huber, D.J., Watkins, C.B. 2012. Influence of wounding and aging on 1-MCP sorption and metabolism in fresh-cut tissue and cell-free homogenates from apple fruit. *Postharvest Biol. Technol.* 67:52-58.
125. Lee, J., Rudell, D.R., Davies, P.J., Watkins, C.B. 2012. Metabolic changes in 1-methylcyclopropene (1-MCP)-treated 'Empire' apple fruit during storage. *Metabolomics* 8:742-753.
124. Lurie, S., Watkins, C.B. 2012. Superficial scald, its etiology and control. *Postharvest Biol. Technol.* 65:44-60.
123. Watkins, C.B., Nock, J.F. 2012. Controlled-atmosphere storage of 'Honeycrisp' apples. *HortScience* 47:886-892.
122. Watkins, C.B., Nock, J.F. 2012. Rapid 1-methylcyclopropene (1-MCP) treatment and delayed controlled atmosphere storage of apples. *Postharvest Biol. Technol.* 69:24-31.
121. Gallardo, K., Kupferman, E.M., Beaudry, R., Blankenship, S.M., Mitcham, E.J., Watkins, C.B. 2011. Market quality of Pacific Northwest pears. *J. Food Distrib. Res.* 42:89-99.
120. Jung, S.K., Watkins, C.B. 2011. Involvement of ethylene in browning development of controlled atmosphere-stored 'Empire' apple fruit. *Postharvest Biol. Technol.* 59:219-226.
119. Rugkong, A., McQuin, R., Giovannoni, J.J., Rose, J.K.C., Watkins, C.B. 2011. Expression of ripening-related genes in cold stored tomato fruit. *Postharvest Biol. Technol.* 60:1-14.
118. Deewatthanawong, R., Watkins, C.B. 2010.  $\gamma$ -Aminobutyric acid (GABA) metabolism in CO<sub>2</sub> treated tomatoes. *Postharvest Biol. Technol.* 57:97-105.
117. Deewatthanawong, R., Nock, J.F., Watkins, C.B. 2010.  $\gamma$ -Aminobutyric acid (GABA) accumulation in four strawberry cultivars in response to elevated CO<sub>2</sub> storage. *Postharvest Biol. Technol.* 57:92-96. [Corrigendum *Postharvest Biol. Technol.* 60:173].
116. Jeong, C.S., Watkins, C.B. 2010. Effects of mixed gas in active MA packaging on marketability maintenance at simulated tomato fruits marketing. *Hort. Environ. Biotechnol* 51:184-188.
115. Legnani, G., Watkins, C.B., Miller, W.B. 2010. Effects of hypoxic and anoxic controlled atmospheres on carbohydrates, organic acids, and fermentation products in Asiatic hybrid lily bulbs. *Postharvest Biol. Technol.* 56:85-94.

114. Rugkong, A., Rose, J.K.C., Lee, S.J., Giovannoni, J.J., O'Neill, M.A., Watkins, C.B. 2010. Cell wall metabolism in cold-stored tomato fruit. *Postharvest Biol. Technol.* 57:106-113.
113. Tsantili, E. Shin, Y., Nock, J.F., Watkins, C.B. 2010. Antioxidant concentrations during chilling injury development in peaches. *Postharvest Biol. Technol.* 57:27-34.
112. Watkins, C.B., Liu, F.W. 2010. Temperature and carbon dioxide interactions on quality of controlled atmosphere-stored 'Empire' apples. *HortScience* 45:1708-1712.
111. Fawbush, F., Nock, J.F., Watkins, C.B. 2009. Antioxidant contents and activity of 1-methylcyclopropene (1-MCP)-treated 'Empire' apples in air and controlled atmosphere storage. *Postharvest Biol. Technol.* 52:30-37.
110. Jung, S.K., Watkins, C.B. 2009. 1-Methylcyclopropene treatment and bruising of different apple cultivars during storage. *J. Hort. Sci. Biotech.* 84:143-148.
109. Peck, G.M., Merwin, I.A., Watkins, C.B., Chapman, K.W., Padilla-Zakour, O.I. 2009. Maturity and quality of 'Liberty' apple fruit under integrated and organic fruit production systems are similar. *HortScience* 44:1382-1389.
108. Fawbush, F., Nock, J.F., Watkins, C.B. 2008. External carbon dioxide injury and 1-methylcyclopropene (1-MCP) in the 'Empire' apple. *Postharvest Biol. Technol.* 48:92-98.
107. Jung, S.K., Watkins, C.B. 2008. Superficial scald control after delayed treatment of apple fruit with diphenylamine (DPA) and 1-methylcyclopropene (1-MCP). *Postharvest Biol. Technol.* 50:45-52.
106. Ponce-Valadez, M., Watkins, C.B. 2008. Fermentation and malate metabolism in response to elevated carbon dioxide concentrations in two strawberry cultivars. *Physiologia Plantarum* 134:121-133.
105. Ponce-Valadez, M., Fellman, S.M., Giovannoni, J., Gan, S., Watkins, C.B. 2008. Differential fruit gene expression in two strawberry cultivars in response to elevated CO<sub>2</sub> during storage revealed by a heterologous fruit microarray approach. *Postharvest Biol. Technol.* 51:131-140.
104. Shin, Y., Ryu, J.A., Liu, R.H., Nock, J.F., Watkins, C.B. 2008. Harvest maturity, storage temperature and relative humidity affect fruit quality, antioxidant contents and activity, and inhibition of cell proliferation of strawberry fruit. *Postharvest Biol. Technol.* 49:201-209.
103. Shin, Y., Ryu, J.A., Liu, R.H., Nock, J.F., Polar-Cabrera, K., Watkins, C.B. 2008. Fruit quality, antioxidant contents and activity, and antiproliferative activity of strawberry fruit stored in elevated CO<sub>2</sub> atmospheres. *J. Food Sci.* 73:S339-344.
102. Watkins, C.B. 2008. Overview of 1-MCP trials and uses for edible horticultural crops. *HortScience* 43:86-94.
101. Fernández-Trujillo, J. P., Nock, J.F., Watkins, C.B. 2007. Antioxidant enzyme activities in strawberry fruit exposed to high carbon dioxide atmospheres during cold storage. *Food Chem.* 104:1425-1429.
100. Hotchkiss, J.H., Watkins, C.B., Sanchez, D.G. 2007. Release of 1-methylcyclopropene from heat pressed polymer films. *J. Food Sci.* 72:E330-E334.
99. Kadzere, I., Watkins, C.B., Merwin, I.A., Akinnifesi, F.K., Shaka, J.D.K. 2007. Harvest date affects color and soluble solids concentrations (SSC) of *Uapaca kirkiana* (Muell. Arg.) fruits from natural woodlands. *Agroforest. Syst.* 60:167-173.
98. Saladié, M., Matas, A.J., Isaacson, T., Jenks, M.A., Goodwin, S.M., Niklas, K.J., Xiaolin R., Labavitch, J.M., Shackel, K.A., Fernie, A.R., Lytovchenko, A., O'Neill, M.A., Watkins, C.B., Rose, J.K.C. 2007. A re-evaluation of the key factors that influence tomato fruit softening and integrity. *Plant Physiol.* 144:1012-1028.
97. Shin, Y., Liu, R.H., Nock, J.F., Holliday, D., Watkins, C.B. 2007. Temperature and relative humidity effects on quality, total ascorbic acid, phenolics and flavonoid concentrations, and antioxidant activity of strawberry. *Postharvest Biol. Technol.* 45:349-357.
96. Tsantili, E., Gapper, N.E., Arquiza, J.M.R. A., Whitaker, B.D., Watkins, C.B. 2007. Ethylene and  $\alpha$ -farnesene metabolism in green and red skin of three apple cultivars in response to 1-methylcyclopropene (1-MCP) treatment. *J. Agric. Food Chem.* 55:5267-5276.
95. Watkins, C.B. 2007. The effect of 1-MCP on the development of physiological storage disorders in horticultural crops. *Stewart Postharvest Rev.* 2:11. 6pp [doi: 10.2212/spr.2007.2.11].
94. Amissah, J.G.N., Hotchkiss, J.H., Watkins, C.B. 2006. Diphenylamine and pre-slicing storage effects on the response of apple slices to elevated CO<sub>2</sub> atmospheres. *Postharvest Biol. Technol.* 39:178-184.
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- roadside markets in Malawi. *Agroforest. Syst.* 68:133-142.
91. Kadzere, I., Watkins, C.B., Merwin, I.A., Akinnifesi, F.K., Saka, J.D.K., Mhango, J. 2006. Fruit variability and relationships between color at harvest and quality during storage of *Uapaca kirkiana* (Muell. Arg.) fruit from natural woodlands. *HortScience* 41:352-356.
  90. Legnani, G., Watkins, C.B., Miller, W.B. 2006. Tolerance of dry-sale lily bulbs to elevated carbon dioxide in both ambient and low oxygen atmospheres. *Postharvest Biol. Technol.* 41:198-207.
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  88. Rosenberger, D.A., Engle, C.A., Meyer, F.W., Watkins, C.B. 2006. *Penicillium expansum* invades apples through stems during controlled atmosphere storage. *Plant Health Progress* 10pp. [doi:10.1094/PHP-2006-1213-01-RS].
  87. Tassoni, A., Watkins, C.B., Davies, P.J. 2006. Inhibition of the ethylene response by 1-MCP in tomato suggests that polyamines are not involved in delaying ripening, but may moderate the rate of ripening or over-ripening. *J. Exp. Bot.* 57:3313-3325.
  86. Watkins, C.B. 2006. The uses of 1-methylcyclopropene (1-MCP) on fruits and vegetables. *Biotechnol. Adv.* 24: 389-409.
  85. Watkins, C.B. 2006. 1-Methylcyclopropene (1-MCP) based technologies for storage and shelf life extension. *Int. J. Postharvest Technol. Inov.* 1:62-68.
  84. Watkins, C.B. 2006. Actions and uses of 1-methylcyclopropene (1-MCP). *CAB Reviews: Perspectives Agric. Vet. Sci. Nutr. Natl. Resources* 1 38:1-10 [doi: 10.1078/PAVSNNR20061038].
  83. Arquiza, J.M.R.A., Hay, A.G., Nock, J.F., Watkins, C.B. 2005. 1-Methylcyclopropene (1-MCP) interactions with diphenylamine degradation, superficial scald metabolism, and polyphenol oxidase and peroxidase activities in apple fruit. *J. Agric. Food Chem.* 53: 7665-7570.
  82. Calderon-Lopez, B., Bartsch, J.A., Lee, C.Y., Watkins, C.B. 2005. Cultivar effects on quality of fresh cut apple slices from 1-methylcyclopropene (1-MCP) treated apple fruit. *J. Food Sci.* 70: S221-227.
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## 3. PATENTS

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## 4. TECHNICAL ARTICLES/BOOKS/SYMPOSIA PROCEEDINGS

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