

**Carl E. Sams, Ph.D.**

*Austin Distinguished Professor*  
Department of Plant Sciences  
The University of Tennessee  
112 Plant Biotechnology Building  
2505 E J Chapman Drive  
Knoxville, TN 37996-4500  
Office phone: (865) 974-8818  
E-mail: carlsams@utk.edu

**Formal Education:**

Doctorate of Philosophy, 1980. Michigan State University, Horticulture/Plant Physiology  
Masters of Science, 1976. The University of Tennessee, Plant & Soil Science/Crop Physiology  
Bachelors of Science, 1974. The University of Tennessee, Plant & Soil Science

**Academic/Professional Experience:**

Institute Professor, University of Tennessee Institute of Agriculture. 2020  
Austin Distinguished Professor, Plant Sciences Department, The University of Tennessee,  
Knoxville, TN. 2002-present.  
Professor, Department of Plant Sciences and Landscape Systems, The University of Tennessee,  
Knoxville, TN. 1994 – 2002.  
Associate Professor, Department of Plant and Soil Science, The University of Tennessee,  
Knoxville, TN. 1985 – 1994.  
Assistant Professor, Department of Plant and Soil Science, The University of Tennessee,  
Knoxville, TN. 1983 – 1985.  
Plant Physiologist, USDA, ARS, HSI, Horticultural Crops Quality Lab, Beltsville, MD. 1980 –  
1983.

**Research Program:**

Research in Dr. Sams' group emphasizes the effects of abiotic stress and mineral nutrition on disease resistance, yield, and quality of specialty crops. Related to this effort, investigations involve the effects of environmental, cultural, and genetic interactions on secondary metabolites that are important in human nutrition and plant pest resistance. Current research emphasis is focused on the impact of environmental and genetic factors on plant uptake and partitioning of mineral nutrients, and the metabolism of glucosinolates, carbohydrates, isoflavones, flavonoids, and plant flavor volatiles. Current research also includes projects to improve greenhouse production systems for specialty crops. This research focuses on optimizing fertility in hydroponic systems and developing narrow band LED lighting strategies to optimize yield and nutritional quality of herbs, leafy vegetables, vine crops, and small fruit crops. Other research involves the impact of pre-harvest and post-harvest environments on nutritional quality of specialty crops.

**Teaching:**

- PSLS 430 Greenhouse Management
- PSLS 537 Plant Nutrition

**Professional Recognition:**

- Associate Editor: HortScience (1990-1993).
- Associate Editor: Journal of the American Society for Horticultural Science (1990-1993).
- Chairman, Postharvest Working Group of American Society for Horticultural Science (1990-1991).
- Co-Program Chairman, Annual Meeting of American Society for Horticultural Science (1993).
- Chairman, Mineral Nutrition Working Group of American Society for Horticultural Science (1994-1995).
- Chairman, Environmental Stress Physiology working group of the American Society for Horticultural Science (2000-2001).
- Member of Publications Committee of the American Society for Horticultural Science (1993-1998).
- Chairman, Growth Chambers and Controlled Environments Working Group of American Society for Horticultural Science (2009-2010).
- Co-Chairman, Annual Meetings Scientific Program Committee for the American Society for Horticultural Science (1996-2020).
- Gamma Sigma Delta Research Award of Excellence (1998).
- University of Tennessee Graduate Council, The University of Tennessee Graduate School, (1995–1998); Chair, Graduate Council Credentials Committee (1997–1998).
- President of The University of Tennessee Chapter of Sigma XI (1998-1999).
- ESCOP/ACOP Leadership Development Program Class 9 (1999).
- Fellow of the American Society for Horticultural Science (2000).
- UTK Faculty Senate (2004-2007).
- UTK Faculty Senate, Library Committee (2004-2005).
- UTK Faculty Senate, Research Council Committee (2005-2008).
- University of Tennessee Provost's Award for Research and Creative Achievement (2001).
- University of Tennessee, Institute of Agriculture, W.S. Overton Faculty Merit Award (2004).
- NACTA Teaching Award of Merit (2004).
- B. Ray Thompson Jr. Award for Outstanding Faculty Performance, The University of Tennessee Institute of Agriculture (2007).

- Outstanding Graduate Educator Award, American Society for Horticultural Science (2005).
- Finance Committee of American Society for Horticultural Science (2004-2010).
- Treasurer and Finance Committee Chair of American Society for Horticultural Science (2008-2010).
- Investment Trustees, American Society for Horticultural Science, (2008-2010).
- Board of Directors of American Society for Horticultural Science (2008-2010).
- President Elect, President, Chairman of Board Directors of the Plant Growth Regulation Society of America (2012-2016).
- Research Impact Award, The University of Tennessee, Institute of Agriculture, Agricultural Experiment Station (2018).
- President Elect (2016-2017), President (2017-2018), Board Chairman (2018-2019), American Society for Horticultural Science.
- The Sylvan Harold Wittwer Outstanding Alumni Lecture for The Department of Horticulture, Michigan State University (2019).
- Invited External Reviewer for the Bachelor of Science Program in Agricultural and Environment Systems Program Review. North Carolina A&T State University. College of Agricultural and Environments Sciences. Greensboro, NC (2019).
- USDA ARS External Program Review Committee (2020).

**Publications:** Book Chapters: 2, Refereed: Over 200, Non-Refereed: Over 60 (not shown), Abstracts: Over 280 (not shown).

Niyikiza, Daniel, Piya, Sarbottam; Routray , Pratyush; Miao, Long; kim, Won-Seok ; Burch-Smith, Tessa; Gill, Tom; Sams, Carl; Arelli , Prakash; Pantalone, Vincent; Krishnan, Hari; Hewezi, Tarek. 2020. Interactions of gene expression, alternative splicing, and DNA methylation in determining nodule identity. *The Plant Journal*. (In Press).

Darr, L., M. Cunicelli, H. Bhandari, K. Bilyeu, F. Chen, T. Hewezi, Z. Li, C. E. Sams, and V. R. Pantalone. 2020. Field performance of high oleic soybeans with mutant FAD2-1A and FAD2-1B genes in Tennessee. *J. of the American Oil Chemists' Society*. 97:49-56. DOI 10.1002/aocs.12306

Barickman, T. C., C. R. Simpson, and C. E. Sams. 2019. Waterlogging causes early modification in the physiological performance, carotenoids, chlorophylls, proline, and soluble sugars of cucumber plants. *Plants, Special Issue: Plant Physiology and Metabolism*, 8,6:160-175.

Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2019. Applications of Abscisic Acid and

Increasing Concentrations of Calcium Affect the Partitioning of Mineral Nutrients between Tomato Leaf and Fruit Tissue. *Horticulturae*, 2019,5,49: 1-11.

M. J. Cunicelli, H. Bhandari, P. Chen, C. E. Sams, M. A. R. Mian, L. A. Mozzoni, C. Smallwood, and V. R. Pantalone. 2019. Effect of a mutant Danbaekkong allele on soybean seed yield, protein, and oil concentration. *J. of the American Oil Chemists' Society*, 96:927-935.

Pellegrino, R., J. Wheeler\*, C. E. Sams, and C. R. Lockett. 2019. Storage Time and Temperature impact on the Sensory Properties of Broccoli. *Foods*. 2019, 8(5), 162; <https://doi.org/10.3390/foods8050162>

Ashworth, A. J., F. L. Allen, P. R. Owens, J. M. DeBruyn, and C. E. Sams. 2018. Crop rotations and poultry litter impact long-term soil physicochemical properties and soil biota. *Journal of Environmental Quality*, 47(6): 1327-1338.

Metallo, R, D. A. Kopsell, C. E. Sams, and N. R. Bumgarner. 2018. Influence of blue/red vs. white LED light treatments on biomass, shoot morphology, and quality parameters of hydroponically grown kale. *Scientia Horticulturae* 235: 189-197.

Routray, P., T. Li, A. Yamasaki, A. Yoshinari, J. Takano, W. G. Choi, C. E. Sams, and D. M. Roberts. 2018. Nodulin Intrinsic Protein 7; 1 Is a Tapetal Boric Acid Channel Involved in Pollen Cell Wall Formation. *Plant Physiology*, Vol. 178. pp. 1269-1283.

Sublett, W. L., T. C. Barickman, and C. E. Sams. 2018. The Effect of Environment and Nutrients on Hydroponic Lettuce Yield, Quality, and Phytonutrients. *Horticulturae*, Vol. (4):48: 1-15. Special Issue: Abiotic Stress Effects on Performance of Horticultural Crops.

Sublett, W. L., T. C. Barickman, and C. E. Sams. 2018. Effects of elevated temperature and potassium on biomass and quality of dark red 'Lollo Rosso' Lettuce. *Horticulturea. Horticulturae*, (4)11: 1-11. Special Issue: Plant Production in Controlled Environments.

Wiggins, S. J., C. Smallwood, D. R. West, D. A. Kopsell, C. E. Sams, and V. R. Pantalone. 2018. Agronomic Performance and Seed Inorganic Phosphorus Stability of Low Phytate Soybean Line TN09-239. *J. Am. Oil Chem. Soc.*, 95:787-796.

Ashworth, A. J., F. L. Allen, J. L. Bacon, C. E. Sams, W. E. Hart, J. F. Grant, P. A. Moore, and D. H. Pote. 2017. Switchgrass Cultivar, Yield, and Nutrient Removal Responses to Harvest Timing. *Agronomy Journal*, 109(6):1-8.

Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2017. Abscisic Acid Improves Tomato Fruit

Quality by Increasing Soluble Sugar Concentrations. *Journal of Plant Nutrition*, 7: 964-973.

Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2017. Effects of abscisic acid on tomato fruit aroma volatiles. *Journal of Plant Nutrition*, 40:2096-2100.  
doi.org/10.1080/01904167.2017.1318919

Pan, X., D. T. Earlywine, R. J. Smeda, T. C. Teuton, J. T. English, C. E. Sams, and X. Xiong. 2017. Effect of Oriental Mustard (*Brassica juncea*) Seed Meal for Control of Dollar Spot on Creeping Bentgrass (*Agrostis stolonifera*) Turf. *International Turfgrass Society Research Journal*, 13: 1-9.

Pan, Xiaowei, M. D. Richardson, S. Deng, R. J. Kremer, J. T. English, J. D. Mihail, C. E. Sams, P. C. Scharf, K. S. Veum, and X. Xiong. 2017. Effect of organic amendment and cultural practice on large patch occurrence and soil microbial community. *Crop Science*, 57: 2263-2272.

Bacon, J. L., A. J. Ashworth, F. L. Allen, C. E. Sams, D. D. Tyler, W. E. Hart, and J. F. Grant. 2016. Expanding the harvest window for switchgrass based on phosphorus and potassium remobilization. *Crop Science*, 56:1-8.

Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2016. Abscisic Acid Impacts Tomato Carotenoids, Soluble Sugars, and Organic Acids. *HortScience*, 51(4):1-7.

Barickman, T. C., T. E. Horgan, J. R. Wheeler, and C. E. Sams. 2016. Elevated Levels of Potassium in Greenhouse-grown Red Romaine Lettuce Impacts Mineral Nutrient and Soluble Sugar Concentrations. *HortScience*, 51(9):504-509.

Deyton, D. E., S. H. Hunt, and C. E. Sams. 2016. Influence of Position, Age, and Environmental Factors on Photosynthesis of Red Raspberry Leaves. *Acta Horticulturae*, 1133:247-252.

Kopsell, D. A., C. Belisle, H. Lowery, C. Whitlock, and C. E. Sams. 2016. Genotype and lighting environment impact petal tissue pigmentation in *Tagetes tenuifolia*. *Acta Horticulturae*, 1134:103-110.

Kopsell, D. A., C. E. Sams, and R. C. Morrow. 2016. Interaction of light quality and fertility on biomass, shoot pigmentation and xanthophyll cycle flux in Chinese kale. *Journal of the Science of Food and Agriculture*, 97(3): 911-917. doi: 10.1002/jsfa.7814.

Kopsell, D. A., C. J. Whitlock, C. E. Sams, and D. E. Kopsell. 2016. Nutritionally important pigments in purslane (*Portulaca oleracea*) differ between cultivars and in response to nitrogen. *HortScience*, 51(6):784-787.

Sams, C. E., D. A. Kopsell, and R. C. Morrow. 2016. Light quality impacts on growth, flowering, mineral uptake and petal pigmentation of marigold. *Acta Horticulturae*, 1134:139-145.

Deyton, D. E., L. F. Fowler, and C. E. Sams. 2015. Foliar Applied Uniconazole Effects on Young Apple Trees. *Proceedings of the Plant Growth Regulation Society of America*, pp. 119-125, 42nd Annual PGRSA Conference, July 19-23, 2015, Kona, Hawaii.

Kopsell, D. A., C. E. Sams, and R. C. Morrow. 2015. Blue wavelengths from LED lighting increase nutritionally important metabolites in specialty crops. *HortScience*, 50(9):1285-1288.

Rudolph, R. E., C. E. Sams, R. Steiner, S. H. Thomas, S. Walker, and M. E. Uchanski. 2015. Biofumigation Performance of Four Brassica Crops in a Green Chile Pepper (*Capsicum annuum*) Rotation System in Southern New Mexico. *HortScience* 50(2):1-7.

Bacon, J. L., A. J. Ashworth, F. L. Allen, C. E. Sams, D. D. Tyler, W. E. Hart, and J. F. Grant. 2016. Expanding the harvest window for switchgrass based on phosphorus and potassium remobilization. *Crop Science Society of America Journal*, 56:1-8.

Barickman, T. C., D. A. Kopsell, and C. E. Sams. 2016. Abscisic Acid Impacts Tomato Carotenoids, Soluble Sugars, and Organic Acids. *Hortscience*, 51(4):1-7.

Barickman, T. C., T. E. Horgan, J. R. Wheeler, and C. E. Sams. 2016. Elevated Levels of Potassium in Greenhouse-grown Red Romaine Lettuce Impacts Mineral Nutrient and Soluble Sugar Concentrations. *HortScience*, 51(9):504-509.

Deyton, D. E., S. H. Hunt, and C. E. Sams. 2016. Influence of Position, Age, and Environmental Factors on Photosynthesis of Red Raspberry Leaves. *Acta Horticulturae*, 1133:247-252.

Kopsell, D. A., C. Belisle, H. Lowery, C. Whitlock, and C. E. Sams. 2016. Genotype and Lighting Environment Impact Petal Tissue Pigmentation in *Tagetes tenuifolia*. *Acta Horticulturae*, 1134:103-109.

Sams, C. E., D. Kopsell, and R. C. Morrow. 2016. Light Quality Impacts on Growth, Flowering, Mineral Uptake and Petal Pigmentation of Marigold. *Acta Horticulturae*, 1134:139-145.

Kopsell, D. A., C. E. Sams, and R. C. Morrow. 2015. Blue wavelengths from LED lighting increase nutritionally important metabolites in specialty crops. *HortScience*, 50(9):1285-1288.

- Rudolph, R. E., C. E. Sams, R. Steiner, S. H. Thomas, S. Walker, and M. E. Uchanski. 2015. Biofumigation Performance of Four Brassica Crops in a Green Chile Pepper (*Capsicum annuum*) Rotation System in Southern New Mexico. *HortScience*, 50(2):1-7, 2015.
- Ashworth, A. J., F. L. Allen, J. P. Wight, A. M. Saxton, D. D. Tyler, and C. E. Sams. 2014. Soil organic carbon sequestration rates under crop sequence diversity, bio-covers, and no-tillage. *Soil Science Society of America J.*, 78:1726-1733.
- Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2014. Exogenous foliar and root applications of abscisic acid increase the influx of calcium into tomato fruit tissue and decrease the incidence of blossom-end rot. *HortScience*, 49(11):1397-1402.
- Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2014. Abscisic acid increases carotenoid and chlorophyll in leaves and fruit of two tomato genotypes. *Journal of the American Society for Horticultural Science*, 139(3):261-266.
- Coolong, Timothy, S. Mishra, T. C. Barickman, and C. E. Sams. 2014. Impact of Supplemental Calcium Chloride on Yield, Quality, Nutrient Status, and Postharvest Attributes of Tomato. *Journal of Plant Nutrition*, 37:2316-2330. doi.org/ 10.1080/01904167.2014.890222
- Kopsell, D. A., C. E. Sams, T. C. Barickman, and R. C. Morrow. 2014. Sprouting Broccoli Accumulate Higher Concentrations of Nutritionally Important Metabolites under Narrow-band Light-emitting Diode Lighting. *Journal of the American Society for Horticultural Science*, 139(4):469-477.
- McCarty, D. G., B. H. Ownley, A. L. Wszelaki, S. Eichler Inwood, C. E. Sams, and D. M. Butler. 2014. Field evaluation of anaerobic soil disinfestation (ASD) carbon sources for tomato and bell pepper production in Tennessee. *HortScience*, 49:272-280.
- Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2013. Selenium Influences Glucosinolate and Isothiocyanates and Increases Sulfur Uptake in *Arabidopsis thaliana* and Rapid-cycling *Brassica oleracea*. *Journal of Agricultural and Food Chemistry*, 61(1):202-209.
- Barickman, T. C.\*, D. A. Kopsell, and C. E. Sams. 2013. Impact of Selenium Fertilization on Glucosinolate Concentration in *Arabidopsis thaliana* and Rapid Cycling *Brassica oleracea*. *Journal of Plant Nutrition*, 37:343-356. Doi.org/10.1080/01904167.2013.810253.
- Kopsell, Dean A. and Carl E. Sams. 2013. Increases in Shoot Tissue Pigments, Glucosinolates and Mineral Elements in Sprouting Broccoli after Exposure to Short-duration Blue Light from Light Emitting Diodes. *Journal of the American Society for Horticultural Science*, 138 (1):1-7.

Sams, C. E., D. R. Panthee, C. S. Charron, D. A. Kopsell, T. C. Barickman, and J. S. Yuan. 2013. Microarray analysis reveals selenium down-regulates glucosinolate biosynthesis in *Arabidopsis* shoots. *Acta Horticulturae*, 1040:277-279. doi.org/10.17660/ActaHortic.2014.1040.38.

Amundson, S., D. E. Deyton, D. A. Kopsell, J. W. Hitch, A. Moore, and C. E. Sams. 2012. Optimizing plant density and production systems to maximize yield of greenhouse grown 'Trust' tomatoes. *HortTechnology*, 22(1):44-48.

Fallen, B. D., K. Rainey, C. E. Sams, D. A. Kopsell, and V. R. Pantalone. 2012. Evaluation of Agronomic and Seed Characteristics in Elevated Oleic Acid Soybean Lines in the South-Eastern US. *Journal of the American Oil Chemists' Society*, 89:1333-1343.

Griffis, J. L., Jr., C. E. Sams, M. M. Manners, T. G. McDonald, and T. J. K. Radovich. 2012. Purple-fruited Pitanga – Antioxidant Levels and Flavors of Mature Fruits Vary Considerably Among Closely-Related Cultivars. *Acta Horticulturae*, 959:209-216.

Kopsell, D. A., N.I. Pantanizopoulos, C. E. Sams, and D.E. Kopsell. 2012. Shoot tissue pigment levels increase in 'Florida Broadleaf' mustard (*Brassica juncea* L.) microgreens following high light treatment. *Scientia Horticulturae*, 140:96-99.

Deyton, D. E., C. E. Sams, A.L. Cannon, J. C. Cummins, and M. T. Windham. 2011. Management of Powdery Mildew on Flowering Dogwood with Soybean Oil. *Journal of Environmental Horticulture*, 29(4):185–192.

Fallen, B.D., V. R. Pantalone, C. E. Sams, D. A. Kopsell, S. F. Vaughn, and B. R. Moser. 2011. Effect of Soybean Oil Fatty Acid Composition and Selenium Application on Biodiesel Properties. *Journal of the American Oil Chemists' Society*, 88(7):1019-1028, DOI: 10.1007/s11746-010-1746-z.

Panthee, D. R.\*, D. A. Kopsell, and C. E. Sams. 2011. Diversity analysis of *Arabidopsis thaliana* (L.) Heynh ecotypes for glucosinolates in shoots and seeds. *HortScience*, 46(7):968-974.

Sams, C. E., D. R. Panthee, C. S. Charron, D. A. Kopsell, and J. S. Yuan. 2011. Selenium regulates gene expression for glucosinolate and carotenoid biosynthesis in *Arabidopsis*. *Journal of the American Society for Horticultural Science*, 136(1):23-34.

Deyton, D. E., C. E. Sams, and J. C. Cummins. 2010. Effect of Abscisic Acid and Soybean Oil on Delay of Peach Bloom. *Acta Horticulturae*, 884:449-453.



Deyton, D. E., C. E. Sams, and J. C. Cummins. 2010. Effect of Soybean Oil and Abscisic Acid Analogs on Early Grape Growth. *Acta Horticulturae*, 884:455-460.

Earlywine, D.T., R. J. Smeda, T. C. Teuton, C. E. Sams, and X. Xiong. 2010. Evaluation of Oriental Mustard (*Brassica juncea*) Seed Meal for Weed Suppression in Turf. *Weed Technology*, 24: 440-445.

Kopsell, D. A., C. E. Sams, D. E. Deyton, K. Abney, D. E. Kopsell, and L. Robertson. 2010. Characterization of nutritionally important carotenoids in bunching onion accessions. *HortScience*, 45(3):463-465.

Russo, V. M., B. D. Bruton, and C. E. Sams. 2010. Classification of temperature response in germination of Brassicas. *Industrial Crops and Products*, 31 (2010) 48-51.

Sams, C. E., D. E. Deyton, J. C. Cummins, and J. R. Ballington. 2010. Delay of Flower Bud Phenology of Rabbiteye and Southern Highbush Blueberries with Soybean Oil and Abscisic Acid. *Acta Horticulturae*, 884:647-650.

Zhong, Y., C. Krisanapun, S. Lee, T. Nualsanit, C. E. Sams, P. Peungvicha, and S. J. Baek. 2010. Molecular targets of apigenin in colorectal cancer cells: Involvement of p21, NAG-1 and p53. *European Journal of Cancer*, 46 (2010):3365-3374.

Scaboo, A.M., V.R. Pantalone, D.R. Walker, H.R. Boerma, D.R. West, F.R. Walker, and C.E. Sams. 2009. Confirmation of molecular markers and agronomic traits associated with seed phylate content in two soybean RIL populations. *Crop Science*, 49:426-432.

Bondada, B.R., C.E. Sams, D.E. Deyton, and J.C. Cummins. 2009. Viscosity-temperature relationships of soybean oil emulsions and their implications for oil retention by apple and peach leaves. *Journal of Horticultural Science and Biotechnology*, 84(1):17-22.

Kopsell, D.A., C.E. Sams, T. Casey Barickman, D.E. Deyton, and D.E. Kopsell. 2009. Selenization of basil and cilantro through foliar applications of selenate-selenium and selenite-selenium. *HortScience*, 44(2):438-442.

Lefsrud, M.G., D.A. Kopsell, and C.E. Sams. 2008. Irradiance from distinct wavelength Light emitting diodes affects secondary metabolites in kale. *HortScience*, 43(7):2243-2244.

McCurdy, J.D., J.S. McElroy, D.A. Kopsell, C.E. Sams, and J.C. Sorochan. 2008. Effects of mesotrione on perennial ryegrass (*Lolium perenne* L.) carotenoid concentrations under varying environmental conditions. *Journal of Agricultural and Food Chemistry*, 56(9):9133-9139.

Trentham, Robert W., Carl E. Sams, and William S. Conway. 2008. Histological effects of calcium chloride in stored apples. *Journal of the American Society for Horticultural Science*, 133(4):487-491.

A phot from this paper was used as the Journal cover page of this issue.

Teuton, T.C., C.L. Main, J.C. Sorochan, J.S. McElroy, W.E. Hart, C.E. Sams, and T.C. Mueller. 2008. Hybrid Kentucky bluegrass tolerance to preemergence and postemergence herbicides. *Weed Technology*, 22(2):240-244.

Chang, P.T., M.W. van Iersel, W.M. Randle, C.E. Sams. 2008. Nutrient solution concentrations Of  $\text{Na}_2\text{SeO}_4$  affect the accumulation of sulfate and selenate in *Brassica oleracea* L. *HortScience*, 43(3):913-918.

Auge, R.M., H.D. Toler, C.E. Sams, and G. Nasim. 2008. Hydrolic conductivity and water potential gradients in squash leaves showing mycorrhiza-induced increases in stomatal conductance. *Mycorrhiza*, 18(3):115-121.

Belitz, Amy R. and Carl E. Sams. 2007. The effect of population density on growth, yield, and flavonolignan content in milk thistle, *Silybum marianum*. *Acta Horticulturae*, 756: 251-258.

Belitz, Amy R. and Carl E. Sams. 2007. The Effect of Water Stress on the Growth, Yield, and Flavonolignan Content in Milk Thistle, *Silybum marianum*. *Acta Horticulturae*, 756:259-266.

Bondada, B. R., C. E. Sams, D. E. Deyton, and J. C. Cummins. 2007. Oil emulsions enhance transcuticular movement of captan in apple leaves. *Crop Protection*, 26: 691-696.

Kopsell, D.A., C.E. Sams, C.S. Charron, W.M. Randle, and D.E. Kopsell. 2007. Kale carotenoids remain stable while glucosinolates and flavor compounds respond to changes in selenium and sulfur fertility. Proceedings for the 1<sup>st</sup> International Symposium on Human Health Effects of Fruits and Vegetables. *Acta Horticulturae*, 744:303-309.

Kopsell, D.A., T.C. Barickman, C.E. Sams, and J.S. McElroy. 2007. Influence of nitrogen and sulfur on biomass production, carotenoid and glucosinolate concentrations in watercress (*Nasturtium officinale* R. Br.). *Journal of Agricultural and Food Chemistry*. 55(26):10628-34.

Toler, H.D., C.S. Charron, D.A. Kopsell, C.E. Sams, and W.M. Randle. 2007. Increasing selenium concentration in *Brassica oleracea* decreases glucosinolate concentration. Proceedings for the 1<sup>st</sup> International Symposium on Human Health Effects of Fruits and Vegetables. *Acta Horticulturae*, 744:311-315.

- Kopsell, D.A., J.S. McElroy, C.E. Sams, and D.E. Kopsell. 2007. Genetic variation in carotenoid concentrations among diploid and amphidiploid Brassica species. *HortScience*, 42(3):461-465.
- Panthee, D. R., V.R. Pantalone, A. M. Saxton, D. R. West, and C.E. Sams. 2007. Quantitative trait loci for agronomic traits in soybean. *Plant Breeding*, 126:51-57.
- Chardonnet, C. O., C. S. Charron, C. E. Sams, and W. S. Conway. 2006. Screening of nine echinacea supplements for antitumor activity using the potato disc bioassay. *Journal of Herbs, Spices and Medicinal Plants*, 12:107-116. Doi: 10.1300/J044v12n01\_10.
- Karpinets, T. V., D. J. Greenwood, C. E. Sams, and J. T. Ammons. 2006. RNA: Protein ratio of the unicellular organism as a characteristic of phosphorus and nitrogen stoichiometry and of the cellular requirement of ribosomes for protein synthesis. *BMC Biology* 2006, 4:30 DOI: 10.1186/1741-7007-4-30. pg. 1-10.
- Panthee, D. R., V. R. Pantalone, C. E. Sams, A. M. Saxton, D. R. West, J. H. Orf, and A. S. Killam. 2006. Quantitative trait loci controlling sulfur containing amino acids, methionine and cysteine, in soybean seeds. *Theoretical and Applied Genetics*, 112:546-553. DOI 10.1007/s00122-005-0161-6.
- Panthee, D. R., V. R. Pantalone, A. M. Saxton, D. R. West, and C. E. Sams. 2006. Genomic regions associated with amino acid composition in soybean. *Molecular Breeding*, 17:79-89.
- Panthee, D. R., V. R. Pantalone, A. M. Saxton, D. R. West, and C. E. Sams. 2006. Quantitative trait loci for agronomic traits in soybean. *Plant Breeding*, 125:1-7.
- Park, E., T. Solomos, J. L. McEvoy, W. S. Conway, and C. E. Sams. 2006. The effect of calcium on the expression of polygalacturonase activity by *Colletotrichum acutatum* in apple fruit. *Plant Pathology Journal*, 5(2):183-190.
- Toler, H. D., C. S. Charron, C. E. Sams, and W. R. Randle. 2006. Selenium increases sulfur uptake and regulates glucosinolate metabolism in rapid-cycling *Brassica oleracea*. *Journal of the American Society for Horticultural Science*, 132(1):1-6.
- Wu, T., S. Zivanovic, F. A. Draughon, W. S. Conway, and C. E. Sams. 2005. Physicochemical properties and bioactivity of fungal chitin and chitosan. *Journal of Agricultural and Food Chemistry*, 53:3888-3894.
- Charron, Craig S., Fred L. Allen, Richard D. Johnson, Vincent R. Pantalone, and Carl E. Sams. 2005. Correlations of oil and protein with isoflavone concentration in soybean (*Glycine max* (L.) Merr.). *Journal of Agricultural and Food Chemistry*, 53(18):7128-7135.

Charron, Craig S., Arnold M. Saxton, and Carl E. Sams. 2005. Relationship of climate and genotype to seasonal variation in the glucosinolate-myrosinase system. I. Glucosinolate content in ten cultivars of *Brassica oleracea* grown in fall and spring seasons. *Journal of Science of Food and Agriculture*, 85:671-681.

Charron, Craig S., Arnold M. Saxton, and Carl E. Sams. 2005. Relationship of climate and genotype to seasonal variation in the glucosinolates-myrosinase system. II. Myrosinase activity in ten cultivars of *Brassica oleracea* grown in fall and spring seasons. *Journal of Science of Food and Agriculture*, 85:682-690.

Hyten, David L., Vincent R. Pantalone, Carl E. Sams, Arnold M. Saxton, D. Landau-Ellis, T. R. Stefaniak, and Michael E. Schmidt. 2004. Seed quality QTL in a prominent soybean population. *Theoretical and Applied Genetics*, 109:552-561.

Hyten, David L., Vincent R. Pantalone, Arnold M. Saxton, Michael E. Schmidt, and Carl E. Sams. 2004. Molecular mapping and identification of soybean fatty acid modifier quantitative trait loci. *Journal of the American Oil Chemists 'Society*, 81(12):1115-1118.

Panthee, D.R., V.R. Pantalone, D.R. West, A.M. Saxton, and C.E. Sams. 2005. Quantitative trait loci for seed protein and oil concentration, and seed size in soybean. *Crop Science*, 45: 2015-2022.

Price, A.J., C.S. Charron, A.M. Saxton, and C.E. Sams. 2005. Allyl isothiocyanate and carbon dioxide produced during degradation of *Brassica juncea* tissue in different soil conditions. *Hortscience*, 40(6):1734-1739.

Panthee, D.R., P. Kwanyuen, C.E. Sams, D.R. West, A.M. Saxton, and V.R. Pantalone. Quantitative trait loci for b-conglycinin (7S) and glycinin (11S) fractions of soybean storage protein. 2004. *Journal of the American Oil Chemists 'Society*, 81:1005-1012.

Park, E., T. Solomos, J.L. McEvoy, W. S. Conway, and C. E. Sams. 2005. The effect of calcium on the expression of oligogalacturonase activity by *Colletotrichum acutatum* in apple fruit. *Plant Pathology Journal*, 5(2):183-190.

Price, Andrew J., Craig S. Charron, Arnold M. Saxton, and Carl E. Sams. 2005. Allyl isothiocyanate and carbon dioxide produced during degradation of *Brassica juncea* tissue in different soil conditions. *HortScience*, 40(6):1734-1739.

Wu, Tao, Svetlana Zivanovic, F. Ann Draughon, William S. Conway, and Carl E. Sams. 2005. Physicochemical properties and bioactivity of fungal chitin and chitosan. *Journal of Agricultural and Food Chemistry*, 53(10):3888-3894.

Wu, Tao, Svetlana Zivanovic, F. Ann Draughon, and Carl E. Sams. 2005. Chitin and chitosan-Value-added products from mushroom waste. *Journal of Agricultural and Food Chemistry*, 52(26):7905-7910.

Charron, Craig S., Arnold M. Saxton, and Carl E. Sams. 2004. Relationship of climate and genotype to seasonal variation in the glucosinolate-myrosinase system. I. Glucosinolate content in ten cultivars of *Brassica oleracea* grown in fall and spring seasons. *Journal of the Science of Food and Agriculture*, 85(4):671-681.

Charron, Craig S., Arnold M. Saxton, and Carl E. Sams. 2004. Relationship of climate and genotype to seasonal variation in the glucosinolate-myrosinase system: II. Myrosinase activity in ten cultivars of *Brassica oleracea* grown in fall and spring seasons. *Journal of the Science of Food and Agriculture*, 85(4):682-690.

Charron, Craig S. and Carl E. Sams. 2004. Glucosinolate content and myrosinase activity in rapid-cycling *Brassica oleracea* grown in a controlled environment. *Journal of the American Society for Horticultural Science*, 129(3): 321-330.

Coolong, Timothy W., William M. Randle, Heather D. Toler, and Carl E. Sams. 2004. Zinc availability in hydroponic culture influences glucosinolate concentrations in *Brassica rapa*. *Hortscience*, 39(1):84-86.

Panthee, D.R., P. Kwanyuen, C.E. Sams, D.R. West, A.M. Saxton, and V.R. Pantalone. Quantitative trait loci for b-conglycinin (7S) and glycinin (11S) fractions of soybean storage protein. 2004. *Journal of the American Oil Chemists 'Society*, 81:1005-1012.

Panthee, D. R., V. R. Pantalone, C. E. Sams, A. M. Saxton, D.R. West, and W. E. Rayford. 2004. Genomic regions governing soybean seed nitrogen accumulation. *Journal of the American Oil Chemists 'Society*, 81:77-81.

Chardonnet, C.O., C.S. Charron, C.E. Sams, and W.S. Conway. 2003. Chemical changes in the cortical tissue and cell walls of calcium-infiltrated Golden Delicious apples during storage. *Postharvest Biology and Technology*, 28:97-111.

Fare D. C., D.E. Deyton, and C.E. Sams. 2003. Chemical defoliant on fall harvested bare root nursery crops. *Proceedings of the Southern Nurserymen's Association*, 48:281-284.

Kopsell, David E., Dean A. Kopsell, William M. Randle, Timothy W. Coolong, Carl E. Sams, and Joanne Curran-Celentano. 2003. Kale carotenoids remain stable while flavor compounds respond to changes in sulfur fertility. *Journal of Agricultural Food Chemistry*, 51(18) 5319-5325.

Moran, R.E, D.E. Deyton, C.E. Sams, C.D. Pless, and J.C. Cummins. 2003. Soybean oil as a summer spray for apple: European red mite control, net CO<sub>2</sub> assimilation and phytotoxicity. *HortScience*, 38:234-238.

Sams, Carl E. and William S. Conway. 2003. Preharvest nutritional factors affecting postharvest physiology. In: *Postharvest Physiology and Pathology of Vegetables*. Eds. Jerry A. Bartz and Jeffrey K. Brecht. Marcel Dekker, Inc. NY, NY. Pgs. 161-176. ISBN: 0-8247-0687-0.

Chardonnet, Catherine O., Carl E. Sams, William S. Conway, Francis A. Draughon, and John R. Mount. 2002. Osmotic dehydration of apple slices with CaCl<sub>2</sub> and sucrose limits decay caused by *Penicillium expansum*, *Colletotrichum acutatum* and *Botrytis cinerea* and does not promote *Listeria monocytogenes* or total aerobic population growth. *Journal of Food Protection*, 65(1):172-177.

Charron, C.S., C.E. Sams, and C.H. Canaday. 2002. Impact of glucosynolate content in broccoli (*Brassica oleracea* (Italica Group)) on growth of *Pseudomonas marginalis*, a causal agent of bacterial soft rot. *Plant Disease*, 86:629-632.

Harvey, Stephanie G., Heather N. Hannahan, and Carl E. Sams. 2002. Indian mustard and allyl isothiocyanate inhibit *Sclerotium Rolfsii*. *Journal of the American Society for Horticultural Science*, 127(1):27-31.

Noble, R.R.P., S.G. Harvey, and C.E. Sams. 2002. Toxicity of Indian mustard and allyl isothiocyanate to masked chafer beetle larvae. *Plant Health Progress*. June 10.  
[www.plantmanagementnetwork.org/pbu/php/research/chafer/](http://www.plantmanagementnetwork.org/pbu/php/research/chafer/)

Chardonnet, C.O., C.E. Sams, W.S. Conway, J.R. Mount, and F.A. Draughon. 2001. Osmotic dehydration of apple slices using a sucrose/CaCl<sub>2</sub> combination to control spoilage caused by *Botrytis cinerea*, *Colletotrichum acutatum*, and *Penicillium expansum*. *Journal of Food Protection*, 64(9):1425-1429.

Charron, C.S., D.A. Kopsell, W.M. Randle, and C.E. Sams. 2001. Sodium selenate fertilization increases selenium accumulation and decreases glucosynolate concentration in rapid-cycling *Brassica oleracea*. *Journal of Science of Food and Agriculture*, 81:962-966.

Bondada, B.R., C.E. Sams, D.E. Deyton, and J.C. Cummins. 2000. Apple and peach leaf and stem surface morphology and soybean oil retention as influenced by simulated rainfall and soybean oil emulsions. *Journal of the American Society for Horticultural Science*, 125:553-557.

Chardonnet, C.O., C.E. Sams, R.N. Trigiano, and W.S. Conway. 2000. Variability of three isolates of *Botrytis cinerea* affects the inhibitory effects of calcium on this fungus. *Phytopathology*, 90:769-774.

Conway, W.S., B. Leverentz, R. A. Saftner, W. J. Janisiewicz, C. E. Sams, and E. Leblanc. 2000. Survival and growth of *Listeria monocytogenes* on fresh-cut apple slices and its interaction with *Glomerella cingulata* and *Penicillium expansum*. *Plant Disease*, 84:177-181.

Harvey, Stephanie J. and Carl E. Sams. 2000. Allyl isothiocyanate released from *Brassica Juncea* suppresses mycelial growth of *Sclerotium rolfsii*. Proceedings of the Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions Methyl Bromide Alternatives Outreach, USEPA and USDA. 2000: 21-1 to 21-3.

Leverentz, B., W. J. Janisiewicz, W.S. Conway, R. A. Saftner, Y. Fuchs, C.E. Sams, and M. J. Camp. 2000. Combining yeasts or a bacterial biocontrol agent and heat treatments to reduce postharvest decay of 'Gala' apples. *Postharvest Biology and Technology*, 21:87-94.

Moran, R.E., D.E. Deyton, C.E. Sams, and J.C. Cummins. 2000. Applying soybean oil to dormant peach trees thins flower buds. *Hortscience*, 35:615-619.

Roberts, R.K., D.E. Deyton, and C.E. Sams. 2000. Economics of using soybean oil to reduce peach freeze damage and thin fruit. *HortTechnology*, 10:211-217.

Stiles, C. L., C. E. Sams, D. K. Robinson, D. L. Coffey, and T. C. Mueller. 2000. Influence of metam sodium on the dissipation and residual biological activity of the herbicides EPTC and pebulate in surface soil under black plastic mulch. *Journal of Agricultural and Food Chemistry*, 48:4681-4686.

Chardonnet, C.O., C.E. Sams, and W.S. Conway. 1999. Calcium effort on the mycelial cell walls of *Botrytis cinerea*. *Phytochemistry*, 52(6): 967-973.

Charron, C.S. and C.E. Sams. 1999. Inhibition of *Pythium ultimum* and *Rhizoctonia solani* by shredded leaves of Brassica species. *Journal of the American Society for Horticultural Science*, 124:462-467.

- Chenglin Y., W.S. Conway, R. Ren, D. Smith, G.S. Ross, and C.E. Sams. 1999. Gene encoding polygalacturonase inhibitor in apple fruit is developmentally regulated and activated by wounding and fungal infection. *Plant Molecular Biology*, 39: 1231-1241.
- Noble, Ryan R.P. and Carl E. Sams. 1999. Biofumigation as an alternative to methyl bromide for control of white grub larvae. Proceedings of the Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions. Methyl Bromide Alternatives Outreach, USEPA, and USDA sponsors. San Diego, CA. Nov. 1-4, 1999. 92-1 to 92-3.
- Pless, C.D., R.L. Hix, D.E. Deyton, and C.E. Sams. 1999. Management of San Jose Scale (*Homoptera Diaspididae*) on apple with soybean oil dormant sprays. *HortScience*, 34:106-108.
- Roy, Stephane, W.S. Conway, A. E. Watada, C.E. Sams, E. F. Erbe and W.P. Wergin. 1999. Changes in the Ultrastructure of Epicuticular Wax and Postharvest Calcium Uptake in Apples. *HortScience*, 34(1):121-124.
- Sams, C.E. 1999. Preharvest factors affecting postharvest texture. *Postharvest Biology and Technology*, 15:249-254.
- Warne, T.R., L.G. Hickok, C.E. Sams, and D.L. Vogelien. 1999. Sodium/potassium selectivity and pleiotropy in *stl2*, a highly salt-tolerant mutation of *Ceratopteris richardii*. *Plant, Cell and Environment*, 22: 1027-1034.
- Bruton, B. D., W. S. Conway, K. C. Gross, J. X. Zhang, C. S. Biles, and C. E. Sams. 1998. Polygalacturonases of a latent and wound postharvest fungal pathogen of muskmelon fruit. *Postharvest Biology and Technology*, 13:205-214.
- Howard, D.D., C.O. Gwathmey, and C.E. Sams. 1998. Foliar feeding of cotton: Evaluating potassium sources, potassium solution buffering, and boron. *Agronomy Journal*, 90:740-746.
- Janisiewicz, W.J, W.S. Conway, D.M. Glenn, and C.E. Sams. 1998. Integrating biological control and calcium treatment for controlling postharvest decay of apples. *HortScience*, 33:105-109.
- Picchioni, G. A., A.E. Watada, W.S. Conway, B.E. Whitaker, and C.E. Sams. 1998. Postharvest calcium infiltration delays membrane lipid catabolism in 'Golden Delicious' apples. *Journal of Agricultural and Food Chemistry*, 46:2452-2457.
- Saftner, R. A., W.S. Conway, and C.E. Sams. 1998. Effects of postharvest calcium and fruit coating treatments on postharvest life, quality maintenance, and fruit-surface injury in 'Golden Delicious' apples. *Journal of the American Society for Horticultural Science*, 123:294-299.



- Saftner, R. A., W.S. Conway, and C.E. Sams. 1998. Effect of postharvest calcium chloride treatments on tissue water relations, cell wall calcium levels, and postharvest life of 'Golden Delicious' apples. *Journal of the American Society for Horticultural Science*, 123:893-897.
- Ben-Shalom, N., W.S. Conway, K.C. Gross, C. E. Sams, and R. Pinto. 1997. Differential degradation of apple cell walls *in vitro* by enzyme extracts from *Botrytis cinerea* and *Glomerella cingulata*. *Carbohydrate Polymers*, 33:109-113.
- Fellahi, E., W.S. Conway, K.D. Hickey, and C.E. Sams. 1997. The role of calcium and nitrogen in postharvest quality and disease resistance of apples. *HortScience*, 32:831-835.
- Klein, J. D., W.S. Conway, B.D. Whitaker, and C.E. Sams. 1997. *Botrytis cinerea* decay in apples is inhibited by postharvest heat and calcium treatment. *Journal of the American Society for Horticultural Science*, 122:91-94.
- Saftner, R. A., W.S. Conway, C.E. and Sams. 1997. Effects of some polyamine inhibitors and calcium on *in vitro* growth and decay development in apples caused by *Botrytis cinerea* and *Penicillium expansum*. *Journal of the American Society for Horticultural Science*, 122:380-385.
- Saftner, R. A., J.G. Buta, W.S. Conway, and C.E. Sams. 1997. Effect of surfactants on pressure infiltration of calcium chloride solutions into 'Golden Delicious' apples. *Journal of the American Society for Horticultural Science*, 122:386-391.
- Whitaker, B. D., J.D. Klein, W.S. Conway, and C.E. Sams. 1997. Influence of prestorage heat and calcium treatments on lipid metabolism in 'Golden Delicious' apples. *Phytochemistry*, 45:473-476.
- Yao, C., W. S. Conway, and C. E. Sams. 1996. Purification and characterization of a polygalacturonase produced by *Penicillium expansum* in apple fruit. *Phytopathology*, 86:1160-1166.
- Roy, S., W. S. Conway, J. G. Buta, A. E. Watada, C. E. Sams and W. P. Wergin. 1996. Surfactants affect calcium uptake from postharvest treatment of 'Golden Delicious' apples. *Journal of the American Society for Horticultural Science*, 121:1179-1184.
- Deyton, D. E., C.E. Sams, and D.W. Lockwood. 1996. Cambial browning of cold injured peach nursery trees. *Fruit Varieties Journal*, 50(4):226-229.
- Myers, R.E., D.E. Deyton, and C.E. Sams. 1996. Applying soybean oil to dormant peach trees alters internal atmosphere, reduces respiration, delays bloom, and thins flower buds. *Journal of the American Society for Horticultural Science*, 121(1):96-100.

- Conway, W.S., C.E. Sams, and A.E. Watada. 1995. Relationship between total and cell wall bound calcium following postharvest pressure infiltration of calcium chloride. *Acta Horticulturae*, 398:31-39.
- Roy, S., W.S. Conway, A.E. Watada, C.E. Sams, and W.P. Wergin. 1995. Low-temperature SEM of the epicuticular wax of apples: Structural changes during storage and calcium uptake. *Food Structure*.
- Tobias, R.B., W.S. Conway, and C.E. Sams. 1995. Polygalacturonase produced in apple tissue decayed by *Botrytis cinerea*. *Biochemistry and Molecular Biology International*, 35:813-823.
- Yao, C., W.S. Conway, and C.E. Sams. 1995. Purification and characterization of a polygalacturonase-inhibiting protein from apple fruit. *Phytopathology*, 85:1373-1377.
- Picchioni, G.A., A.E. Watada, W.S. Conway, B.D. Whitaker, and C.E. Sams. 1995. Phospholipid, galactolipid, and sterol lipid composition of apple fruit cortical tissue following postharvest CaCl<sub>2</sub> infiltration. *Phytochemistry*, 39:763-769.
- Pless, C.D., D.E. Deyton, and C.E. Sams. 1995. Control of San Jose Scale, Terrapin Scale and European Red Mite on dormant fruit trees with soybean oil and petroleum oil. *HortScience*, 30:94-97.
- Beavers, W.B., C.E. Sams, W.S. Conway, and G.A. Brown. 1994. Calcium source affects calcium content, firmness, and degree of injury of apples during storage. *HortScience*, 29:1520-1523.
- Conway, W.S., C.E. Sams, G.A. Brown, W.B. Beavers, R.B. Tobias, and L.S. Kennedy. 1994. Pilot test for the commercial use of postharvest pressure infiltration of calcium into apples to maintain fruit quality in storage. *HortTechnology*, 4(3):239-243.
- Conway, W.S., C.E. Sams, and A. Kelman. 1994. Enhancing natural mechanisms of resistance to postharvest diseases through calcium applications. *HortScience*, 29:751-754.
- Conway, W.S., C.E. Sams, C.Y. Wang, and J.A. Abbott. 1994. Additive effects of postharvest calcium and heat treatment on reducing decay and maintaining quality in apples. *Journal of the American Society for Horticultural Science*, 119:49-53.
- Roy, S., W.S. Conway, A.E. Watada, C.E. Sams, C.D. Pooley, and W.P. Wergin. 1994. Distribution of the anionic sites in the cell wall of apple fruit after calcium treatment: Quantitation and visualization by a cationic colloidal gold probe. *Protoplasma*, 178:156-167.

Roy, S., W.S. Conway, A.E. Watada, C.E. Sams, E.F. Erbe, and W.P. Wergin. 1994. Heat treatment affects epicuticular wax structure and postharvest calcium uptake in 'Golden Delicious' apples. *HortScience*, 29:1056-1058.

Sams, C.E. 1994. Management of postharvest disease resistance in horticultural crops: Introduction to the colloquium. *HortScience*, 29:746-747.

Tomaszewski, Z., Jr., A.I. Kuklin, C.E. Sams, and B.V. Conger. 1994. Influence of low temperature on somatic embryogenesis and ethylene preincubation emanation from orchardgrass leaves. *Plant Growth Regulation*, 14:229-234.

Bruten, B.D., S.C. Ledlin, J.K. Collins, and C.E. Sams. 1993. Postharvest decay of muskmelon caused by *Epicoccum Nigrum*. *Plant Disease*, 77:1060-1062.

Sams, C.E., W.S. Conway, J.A. Abbott, R.J. Lewis, and Noach Ben-Shalom. 1993. Firmness and decay of apples following post-harvest pressure infiltration of calcium and heat treatment. *Journal of the American Society for Horticultural Science*, 118(5):623-627.

Tobias, R.B., W.S. Conway, and C.E. Sams. 1993. Polygalacturonase isozymes from *Botrytis cinerea* grown on apple pectin. *Biochemistry Molecular Biology International*, 30:829-837.

Tobias, R.B., W.S. Conway, C.E. Sams, K.C. Gross, and B.P. Whitaker. 1993. Alterations in cell wall composition of calcium-treated apples inoculated with *Botrytis cinerea*. *Phytochemistry*, 32:35-39.

Wang, C.Y., W.S. Conway, J.A. Abbott, G.F. Kramer, and C.E. Sams. 1993. Postharvest infiltration of polyamines and calcium influences ethylene production and texture changes in Golden Delicious apples. *Journal of the American Society for Horticultural Science*, 118:801-806.

Conway, W.S., C.E. Sams, R.G. McGuire, and A. Kelman. 1992. Calcium treatment of apples and potatoes to reduce postharvest decay. *Plant Disease*, 76:329-334.

Deyton, D.E., C.E. Sams, and J.C. Cummins. 1992. Application of dormant oil to peach trees modifies bud-twig internal atmosphere. *HortScience*, 27(12):1304-1305.

Conway, W.S., C.E. Sams, J.A. Abbott, and B.D. Bruton. 1991. Postharvest calcium treatment provides broad spectrum protection against apple pathogens. *Plant Disease*, 75:670- 672.

Deyton, D.E., C.E. Sams, and J.C. Cummins. 1991. Strawberry growth and photosynthetic responses to paclobutrazol. *HortScience*, 26:1178-1180.

Abbott, J.A., W.S. Conway, and C.E. Sams. 1989. Postharvest calcium infiltration affects textural attributes of apples. *Journal of the American Society for Horticultural Science*, 114 (6): 932-936.

Songstad, D.D., P.D. Petracek, C.E. Sams, and B.V. Conger. 1989. Effect of 1-aminocyclopropane -1-carboxylic acid and amino-ethyopyvinylglycine on ethylene production and somatic embryogenesis from orchardgrass leaf cultures. *Plant Cell Reproduction*, 7:677-679.

Conway, W.S., K.C. Gross, C.D. Boyer, and C.E. Sams. 1988. Inhibition of *Penicillium expansum* polygalacturonase activity by increased apple cell wall calcium. *Phytopathology*, 78:1052-1055.

Walters, R.D., D.L. Coffey, and C.E. Sams. 1988. Fiber, Nitrate, and Protein Content of Amaranthus Accessions as Affected by Soil N Application Rate and Harvest Date. *HortScience*, 23(2):338-341.

Wenck, A.R., B.V. Conger, R.N. Trigiano, and C.E. Sams. 1988. Inhibition of somatic embryogenesis in orchardgrass by endogenous cytokinesis. *Plant Physiology*, 88(40):990-992.

Conway, W.S., K.C. Gross, and C.E. Sams. 1987. Relationship of bound calcium and inoculum concentration to the effect of postharvest calcium treatment on decay of apples by *Penicillium expansum*. *Plant Disease*, 71(1):78-80.

Conway, W.S. and C.E. Sams. 1987. The effects of postharvest infiltration of calcium, magnesium, or strontium on decay, firmness, respiration, and ethylene production in apples. *Journal of the American Society for Horticultural Science*, 112(2):300-303.

Petracek, P.D. and C.E. Sams. 1987. The influence of boron on the development of broccoli plants. *Journal of Plant Nutrition*, 10(9-16):2095-2107.

Sams, C.E. and W.S. Conway. 1987. Additive effects of controlled-atmosphere storage and calcium chloride on decay, firmness retention, and ethylene production in apples. *Plant Disease*, 71(11):1003-1005.

Conway, W.S. and C.E. Sams. 1985. Influence of fruit maturity on the effect of postharvest calcium treatment on decay of 'Delicious' apples. *Plant Disease*, 69:42-44.

Sams, C.E. and W.S. Conway. 1985. Effects of controlled atmosphere and calcium infiltration on the decay of 'Delicious' apples. *Plant Disease*, 69:747-750.

Wang, C.Y., C.E. Sams, and K.C. Gross. 1985. Ethylene, 1-aminocyclopropane-1-carboxylic acid, soluble polyuronide, and cell wall non-cellulosic neutral sugar content in 'Eldorado' pears during cold storage and ripening. *Journal of the American Society for Horticultural Science*, 110:687-691.

Conway, W.S. and C.E. Sams. 1984. Possible mechanisms by which postharvest calcium treatment reduces decay in apples. *Phytopathology*, 74(2):209-210.

Gross, K.C. and C.E. Sams. 1984. Changes in cell wall neutral sugar composition during fruit ripening: A species survey. *Phytochemistry*, 23(11):2457-2461.

Irwin, P.L., P.E. Pfeffer, W.V. Gerasimowicz, R. Pressey, and C.E. Sams. 1984. Ripening-related perturbations in apple cell wall nuclear spin dynamics. *Phytochemistry*, 23(10):2239-2242.

Sams, C.E. and W.S. Conway. 1984. Effect of calcium infiltration on ethylene production, respiration rate, soluble polyuronide content, and quality of 'Golden Delicious' apple fruit. *Journal of the American Society for Horticultural Science*, 109(1):53-57.

Armitage, A.M., C.E. Sams, R.M. Miranda, W.H. Carlson, and J.A. Flore. 1983. The effect of quantum flux density and net photosynthetic rate on morphology and time to flower of hybrid geraniums. *Scientia Horticulturae*, 21:273-282.

Conway, W.S. and C.E. Sams. 1983. Calcium infiltration of 'Golden Delicious' apples and its effect on decay. *Phytopathology*, 73:1068-1071.

Flore, J.A., G.S. Howell, and C.E. Sams. 1983. Effect of artificial shading on cold hardiness of peach and sour cherry. *HortScience*, 18:321-322.

Sams, C.E. and J.A. Flore. 1983. Factors affecting diurnal and seasonal net photosynthetic rate of sour cherry. *Photosynthesis Research*, 4:307-310.

Sams, C.E. and J.A. Flore. 1982. The influence of age, position, and environmental variables on net photosynthetic rate of sour cherry leaves. *Journal of the American Society for Horticultural Science*, 107:339-344.

Flore, J.A. and C.E. Sams. 1979. Rooting softwood cuttings of sour cherry (*Prunus cerasus* L. 'Montmorency'): A Preliminary Report. *Compact Fruit Tree*, 12:85-86.

Sams, C.E. and W.A. Krueger. 1977. Ethephon alteration of flowering and fruit set pattern of summer squash. *HortScience*, 12:162-164.