

Dr. Carol J. Lovatt

Department of Botany and Plant Sciences-072
University of California, Riverside, CA 92521-0124
Office: 951-827-4663, Cell: 951-660-6730

Education:

University of Rhode Island	Ph.D.	1980	Biol. Sci.
University of Rhode Island	M.S.	1976	Botany
University of Massachusetts	B.A.	1973	Biology

Professional Experience:

7/15 –	Emeritus Professor of Plant Physiology and Plant Physiologist, Dept. of Botany and Plant Sciences and Distinguished Professor in the Graduate Division, University of California, Riverside
7/97 – 6/2015	Professor of Plant Physiology and Plant Physiologist, Dept. of Botany and Plant Sciences, University of California, Riverside
9/01 – 7/05	Chair, Biological Sciences Interdepartmental Program, University of California, Riverside
7/97 – 12/00	Vice Chair, Teaching, Dept. of Botany and Plant Sciences, University of California, Riverside
7/87 – 7/97	Associate Professor of Plant Physiology and Associate Plant Physiologist, Dept. of Botany and Plant Sciences, University of California, Riverside
7/80 - 6/87	Assistant Professor of Plant Physiology and Assistant Plant Physiologist, Dept. of Botany and Plant Sciences, University of California, Riverside
2/80 - 6/80	Postdoctoral Research Botanist, University of California, Riverside

Professional Activities

International Society of Citriculture Executive Committee (1990-2106); Secretary/Treasurer (2001-2016)
Plant Growth Regulation Society of America (1999-); Secretary, 2000-02
Gamma Sigma Delta (1984-); Historian (1985); Secretary (1986); Vice President (1995); President (1996)
Sigma Xi (1979); Vice-President (1987-88); President (1988-89)
Invited keynote speaker: IX World Avocado Congress (Colombia, 2019), 1st International Avocado Congress (Peru, 2018), 1st International Society for Horticultural Science and X Iran National Horticultural Symposium (Iran, 2017), 8th National Congress of the Avocado Product System (Mexico, 2016), South African Avocado Growers Association (South Africa, 2016), VIII World Avocado Congress (Peru, 2015), 24th International Conference on Arginine and Pyrimidines (United Kingdom, 2014).

Honors and Awards

International Society of Citriculture Fellow (Sept. 2016); Honorary Member (Sept. 2016)
Academic Senate Distinguished Service Award, Univ. Calif., Riverside (2008-2009)
American Association for the Advancement of Science Fellow (Nov. 2008)
California Avocado Society Award of Honor (Sept. 2007)
American Society of Horticultural Science Outstanding Graduate Educator Award (May 2007)
Honorary Member of the UCR Golden Key International Honor Society (Apr. 2004)
Academic Senate Distinguished Teaching Award, Univ. Calif., Riverside (1996-1997)
Amer. Soc. Hort. Sci. Award for Most Outstanding Cross-Commodity Research Paper (1988)

Amer. Soc. Hort. Sci. Award for Most Outstanding Research Paper on Fruit Crops (1987)

Teaching Experience

Major Professor

16 PhD students; 14 MS students

Graduate

1981-2002 Botany and Plant Sciences 220 – Physiology of Tree cop Productivity, 3 units – lecture 3 h; 6-10 students; offered every other year

2005-2014 Botany and Plant Sciences 239 – Advanced Plant Physiology, 4 units – lecture 3 h, discussion 1 h, 5-10 students; offered every other year

Upper Division Undergraduate

2008-2016 Botany and Plant Sciences/Biology 143 – Plant Physiology, 4 units – lecture 3h, laboratory 3 h; 20-30 students

2014 Botany and Plant Sciences/Biology 104 – Fundamentals of Plant Biology, 4 units – lecture 3h, laboratory 3 h; 75 students; I taught the plant physiology third of the course

Lower Division Undergraduate

1983-2008 Biology 5B – Introduction to Organismal Biology, 4 units – lecture 3 h, laboratory 3 h; 300-500 students; I taught the plant half of the course

U.S. Patents

No. 5514200; No. 5830255; No. 6113665; No. 6929673; No. 6645268; No. 6896714; No. 7160349; No. 7160350 – for a novel fertilizer; No. 6169057B1; No. 6180569B1 – a new plant growth regulator; No. 8846572; No. 10321684 – use of a natural metabolite to increase yield and fruit size; No. 9044018 – a new solution to alternate bearing (13 U.S. Patents Issued, 2 patents pending)

The goal of my basic and applied research programs is to advance scientific knowledge of the physiological processes regulating flowering, fruit set and fruit development in citrus, avocado and other tree crops and translate this information into new production management strategies. My basic research includes whole tree physiology, hormone regulation of physiological processes, including flowering at the level of floral gene transcription, metabolism, nutrition, and stress physiology. My applied research emphasizes the use of properly timed soil- and foliar-applied fertilizers and plant growth regulators (PGRs) to solve production problems in order to maximize yield of high quality, commercially valuable size fruit annually and increase grower income and the sustainability of commodity-based industries. My current research addresses problem of alternate bearing, production of a high yield on-crop followed by a low yield off-crop, which has a negative economic impact on every step in the production and marketing chain from the orchard to the consumer and on the sustainability of tree crop industries, including citrus, avocado, pistachio and olive.

Selected Technical Peer-reviewed Journal Publications and Technical Symposium Proceedings (from a total >150 technical publications)

Tang, L. and Lovatt, C.J. 2022. Effects of water-deficit stress and gibberellic acid on floral gene expression and floral determinacy in ‘Washington’ navel orange. J. Am. Soc. Hort. Sci. In press.

Orbovic, V., Ravanfar, S.A., Acanda, Y., Narvaez, J., Merritt, B.A., Levy, A, and Lovatt, C.J. 2021. Stress-inducible *Arabidopsis thaliana* RD29A promoter constitutively drives *Citrus sinensis* APETALA1 and LEAFY expression and precocious flowering in transgenic *Citrus* spp. Transgenic Res. <http://doi.org/10.1007/s11248-021-00260-z>

Acosta-Rangel, A., Li, R., Mauk, P., Santiago, L. and Lovatt, C.J. 2021 Effects of temperature, soil moisture and light intensity on the temporal pattern of floral gene expression and flowering of avocado buds (*Persea americana*). Scientia Hort. <https://doi.org/10.1016/j.scienta.2021.109940>

- Tang, L. and Lovatt, C.J. 2019. Effects of low temperature and gibberellic acid on floral gene expression and floral determinacy in 'Washington' navel orange (*Citrus sinensis* L. Osbeck). *Scientia Hort.* <https://doi.org/10.1016/j.scientiahort.2018.08.008>.
- Fichtner, E., Lovatt, C.J. 2018. Alternate bearing in olive. *Acta Hort.* 1199:103-108. doi:10.17660/ActaHortic.2018.1199.17
- Becerra, B.J., Narváez-Vásquez, J., Pillitteri, L.J., Orozco-Cárdenas, M., Tang, L. and Lovatt, C.J. 2017. Identification of *cis*-regulatory elements related to water-deficit and low-temperature stress within the promoter of *Citrus sinensis* *APETALA1*. *Citrus Res. Technol.* 38(1):138-146.
- Ntoukakis, V.E., Negm, F.B. and Lovatt, C.J. 2017. Sink activity in 'Washington' navel orange fruit borne on leafy and leafless inflorescences. *Citrus Res. Technol.* 38(1):32-40.
- Campisi-Pinto, S., Zheng, Y., Rolshausen, P.E., Crowley, D.F., Faber, B., Bender, G., Bianchi, M., Khuong, T. and Lovatt, C.J. 2017. Optimal nutrient concentration ranges of 'Hass' avocado cauliflower stage inflorescences — Potential diagnostic tool to optimize tree nutrient status and increase yield. *HortScience* 52(12):1707-1715. doi: 10.21273/HORTSCI12437-17.
- Wang, M., Zheng, Y., Khuong, T. and Lovatt, C.J. 2016. Developmental differences in antioxidant compounds and systems in normal and small-phenotype fruit of 'Hass' avocado (*Persea americana* Mill.). *Scientia Hort.* 206:15-23.
- Basra, S. and Lovatt, C.J. 2016. Exogenous applications of moringa leaf extract and cytokinins improve plant growth, yield, and fruit quality of cherry tomato. *HortTechnology.* 26:327-337
- Salvo, J.E. and Lovatt, C.J. 2016. Nitrogen fertilization strategies for the 'Hass' avocado that increase total yield without reducing fruit size. *HortTechnology.* 26:426-435.
- Ntoukakis, V., Negm, F.B. and Lovatt, C.J. 2016. Regulation of sucrose phosphate synthase in vascular bundles of Washington navel orange fruit (*Citrus sinensis* L. Osbeck) by a protein kinase and a protein phosphatase. *Citrus Res. Technol.* 37(2):147-155.
- Lovatt, C.J. 2015. Optimizing 'Hass' avocado tree nutrient status to increase grower profit - an overview. *Proceedings of the VIII World Avocado Congress.* 1:17-23.
- Lovatt, C.J., Zheng, Y., Khuong, T., Campisi-Pinto, S., Crowley, D. and Rolshausen, P. 2015. Yield characteristics of 'Hass' avocado trees under California growing conditions. *Proceedings of the VIII World Avocado Congress.* 1:336-341.
- Faber, B.A. and Lovatt, C.J. 2014. Effects of applying less water by partial root zone drying versus conventional irrigation on navel orange yield. *Acta Hort.* 1038:523-530.
- Lovatt, C.J., Selvaraj, A. and Khuong, T. 2014. Foliar application of adenosine increases fruit size of *Solanum lycopersicum*, *Citrus reticulata*, and *Persea americana*. *Acta Hort.* 1042:197-206
- Escobedo-Solórzano, V. and Lovatt, C.J. 2014. Forcing spring bud break in 'Hass' avocado. *Acta Hort.* 1042:207-216.
- Faber, B.A. and Lovatt, C.J. 2013. Use of foliar fertilization to offset effects on navel orange yield due to reduced water and fertilizer applied by partial root zone drying versus conventional irrigation. *Acta Hort.* 984:237-245
- Zheng, Y., Khuong, T., Lovatt, C.J. and Faber, B.A. 2013. Comparison of different foliar-fertilization strategies on yield, fruit size and quality of 'Nules' Clementine mandarin. *Acta Hort.* 984:247-255
- Lovatt, C.J. 2013. Properly timing foliar-applied fertilizers increases efficacy: A review and update on timing foliar nutrient applications to citrus and avocado. *HortTechnology* 23:536-541.
- Tesfay, S.Z., Bertling, I., Bower, J.P., and Lovatt, C.J. 2012. Quest for the function of 'Hass' avocado carbohydrates: *Clues from fruit and seed development as well as seed germination*. *Austral. J. Bot.* 60:79-86.
- Wang, M., Zheng, Y., Khuong, T., and Lovatt, C.J. 2012. Effect of harvest date on the nutritional quality and antioxidant capacity in 'Hass' avocado during storage. *Food Chemistry.* Vol. 135: p.694-698.