SCOTT A. FINLAYSON
Associate Professor of Plant Reproduction and Development
Dept. of Soil and Crop Sciences, Texas A&M University, College Station, Texas

Education/Training

1993 Ph.D. Botany, University of Calgary, Calgary, AB, Canada
1986 B.Sc. Biology, Simon Fraser University, Burnaby B.C., Canada

Positions and Employment

2002- Assistant/Associate Professor, Soil and Crop Sciences, Texas A&M University
1994-2002 Postdoctoral Research Associate, Soil and Crop Sciences, Texas A&M University
1993-1994 Postdoctoral Research Associate, University of Calgary, Calgary, AB, Canada
1988-1993 Graduate Research Assistant, University of Calgary, Calgary, AB, Canada

Program Overview

The main focus of my research program is investigating the roles of environmental signals as conditioners of plant growth and development, and discovering the mechanisms through which they work. Current research interests include defining the pathways and mechanisms associated with the regulation of branch development by light signals (and other signals), using both crop and model species. I also have a broad interest in how phytohormones participate in the regulation of growth and development and stress responses. I currently teach an undergraduate course in Crop Biology and Physiology (SCSC 307) each Fall semester and a graduate course on The Physiological Basis of Crop Improvement (SCSC 689).

Significant 5 Year Accomplishments

Research: My lab has pioneered studies employing sorghum and Arabidopsis to understand the mechanisms associated with the regulation of branching by light signals used by plants to assess competition. We have been successful in delineating a variety of pathways and molecular actors that participate in this process, including roles for various phytohormones and transcriptional regulators. Research in my lab has provided conclusive evidence that the phytohormone abscisic acid acts as a local repressor of branching by inhibiting bud outgrowth, both in response to competition signals and also as part of a general temporal/spatial/developmental program. This represents a new function for this hormone. We also showed that the phytohormone auxin plays a role in restricting branching in response to competition signals, not through altered accumulation of the hormone, but as a result of alterations in auxin signaling pathways. This finding is important since prior research had suggested that competition signaling acted principally by altering auxin abundance. Other accomplishments have highlighted the importance of signal timing and light flux in eliciting branching responses. We have also contributed analytical expertise to expand the knowledge base of the roles of hormones in plant responses to insect and pathogen attack. As part of Dow AgroSciences/Syngenta funded research, we developed facile methods to evaluate 1-MCP efficacy in commercial growing environments and contributed to the further improvement of this compound for field use. Teaching: Instructed four semesters of Crop Biology and Physiology (SCSC 307), two semesters of Special Topics in Plant Hormone and Small Metabolite Analysis (SCSC 689) and one semester of Special Topics in the Physiological Basis of Crop Improvement (SCSC 689). Supervised 3 PhD students, and 3 MS students. Supervised 1 undergraduate research project.

Publications

Ten most recent publications (35 total)

1 **Yao C**, Finlayson SA (2015) Abscisic acid is a general negative regulator of Arabidopsis axillary bud growth. Plant Physiol- in press

2 Zhou J, Lu D, Xu G, Finlayson SA, He P, Shan L (2015) The dominant negative ARM domain uncovers multiple functions of PUB13 in Arabidopsis immunity, flowering and senescence. J Exp Bot- in press, erv148

3 **Reddy SK**, Finlayson SA. (2014) Phytochrome B promotes branching in Arabidopsis by suppressing auxin signaling. Plant Physiol 164: 1542-1550

4 **Reddy SK**, **Holalu SV**, Casal JJ, Finlayson SA. (2014) The timing of low R:FR exposure profoundly affects Arabidopsis branching responses. Plant Sig Behav 9 e28668 doi:10.4161/psb.28668

5 Lei J, Finlayson SA, Salzman RA, Shan L, Zhu-Salzman K (2014) BOTRYTIS-INDUCED KINASE1 Modulates Arabidopsis Resistance to Green Peach Aphids via PHYTOALEXIN DEFICIENT4. Plant Physiol 165: 1657-1670

6 **Reddy SK**, Liu S, Rudd JC, Xue Q, Payton P, Finlayson SA, Mahan J, Akhunova A, **Holalu SV**, Lu N (2014) Physiology and transcriptomics of water-deficit stress responses in wheat cultivars TAM 111 and TAM 112. J Plant Physiol 171: 1289-1298

7 **Reddy SK**, **Holalu SV**, Casal JJ, Finlayson SA (2013) Abscisic acid regulates axillary bud outgrowth responses to the ratio of Red to Far Red light. Plant Physiol 163: 1047-1058

8 Cagnola JI, Ploschuk E, Benech-Arnold T, Finlayson SA, Casal JJ (2012) Stem transcriptome reveals mechanisms to reduce the energetic cost of shade-avoidance responses in tomato. Plant Physiol 160: 1110-1119

9 Su H, Finlayson SA (2012) 1-Methylcyclopropene prevents cotton physiological and molecular responses to ethylene. Plant Growth Regul 68: 57-66

10 Su H, **Abernathy SD**, White RH, Finlayson SA (2011) Photosynthetic photon flux density and phytochrome B interact to regulate branching in *Arabidopsis*. Plant Cell Environ 34: 1986-1998

Professional Experience

- Advised/co-advised 4 postdoctoral research associates, 4 PhD students, and 5 MS students.
- Authored/co-authored 31 peer-reviewed journal articles, 2 book chapters/addenda, 2 proceedings and 35 scientific abstracts/presentations.
- Acquired $731,589 of which all went to my research program.
- Courses instructed: Crop Biology and Physiology (SCSC 307), Special Topics in Plant Hormone and Small Metabolite Analysis (SCSC 689), Special Topics in the Physiological Basis of Crop Improvement (SCSC 689), Plant Growth and Development (SCSC/MEPS 671), Phytohormones and Plant Growth Regulators (MEPS 612).