

■ Research Profiles

Contributions of Ron Ryel to plant UV research

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Figure 4.1: Ron Ryel taking epidermal transmittance measurements with a UV-A PAM instrument in 2007.

It is with great sadness that I report the passing of Ronald J. Ryel who died on 20 October 2015 from complications arising from pancreatic cancer. Ron was a close friend and valued colleague who made a number of significant contributions to ecology, natural resource management and our understanding of the ecophysiological effects of UV radiation on plants. He was born in West Branch, Michigan in 1955 and spent much of his youth outdoors in central Michigan along side his father who was a wildlife biologist. Ron was a skilled modeler and quantitative ecologist who had broad and diverse interests. He earned a B.S. in Environmental Science from Michigan State University, a M.S. in Wildlife Ecology from Utah State University and a Ph.D. in Plant Physiological Ecology from the University of Würzburg. Ron spent 20 years as an Environmental Consult-

ant in Logan, Utah and was a guest scientist at several universities in Germany. During this time he worked closely with Wolfram Beyschlag (Bielefeld University), Martyn Caldwell (USU) and their students on several field projects utilizing canopy models to study canopy architecture and plant-plant interactions (e.g. Beyschlag and Ryel 1999; Ryel et al. 1993; Werner et al. 2001). He joined the USU faculty in 2002 where he mentored a number of students and postdocs on various basic and applied research projects ranging from soil moisture, carbon and nitrogen relations in Great Basin plant communities, the causes and ecological consequences of aspen (*Populus tremuloides*) decline in western North American forests, and the effects of UV radiation on plants (e.g. Flint and Caldwell 2003; LaMalfa and Ryle 2008; Ryel et al. 2003, 2010, 2008). While on the faculty at USU Ron was awarded a Fulbright Scholarship with the Instituto Superior de Agronomia in Lisbon, Portugal where he studied soil water dynamics and shrub encroachment in Portugal's cork oak (*Quercus suber*) woodlands as part of a broader effort to preserve these iconic forests.

Ron's contributions to our understanding of plant and ecosystem responses to UV radiation were similarly broad and diverse. His initial involvement in UV research came in 1986, when he joined a research team at USU led by Martyn Caldwell that included Wolfram Beyschlag, Stephan Flint and myself on a project examining the effects of enhanced UV-B radiation on plant competition. Ron modified an existing single-species canopy radiation and photosynthesis model to accommodate multiple species and through these efforts showed that subtle UV-induced

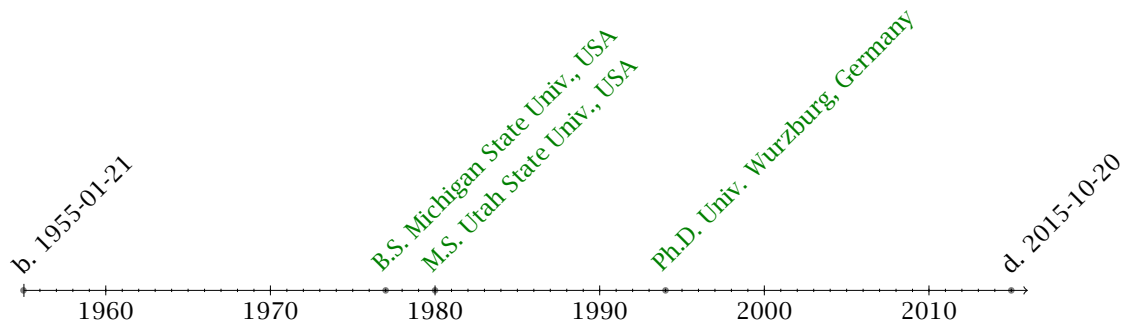


Figure 4.2: Time line for Ron Ryel's education.

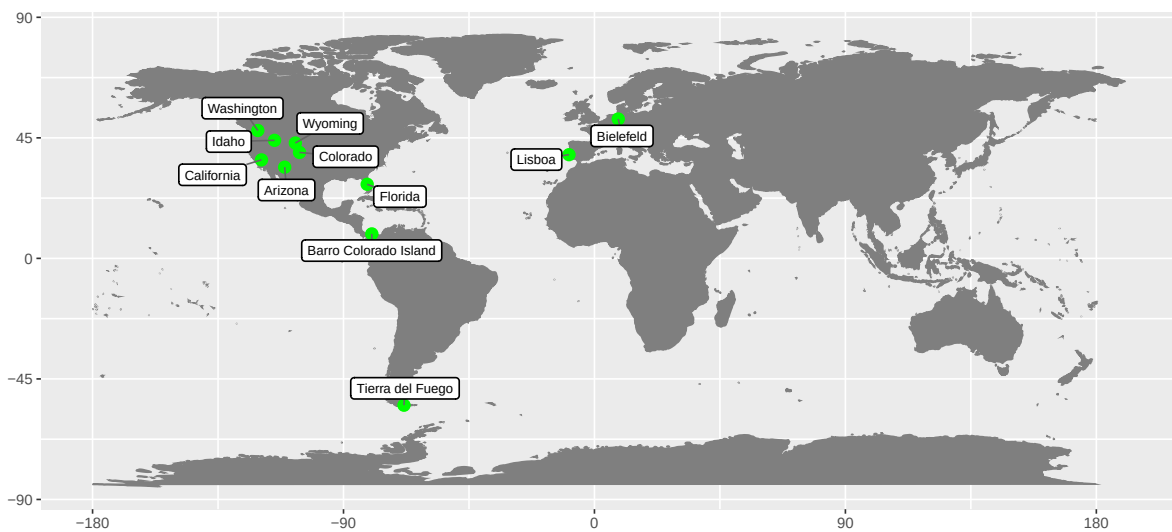


Figure 4.3: Sites where Ron Ryel has done research.

photomorphogenic alterations in shoot morphology could have significant consequences for light interception and canopy photosynthesis of plants when growing in mixed-species stands (P. Barnes et al. 1990; P. W. Barnes et al. 2005; Beyschlag et al. 1990; Ryel et al. 1990). Later, Ron collaborated with Martyn Caldwell, Peter Searles, Carlos Ballaré and myself to explore the utility of chlorophyll fluorescence as a non-invasive probe of epidermal UV-transmittance. Initial studies were conducted using the less-than field portable XE-PAM fluorometer on plants in Argentina (P. W. Barnes et al. 2000). This interest led to studies using the smaller, more portable UVA-PAM fluorometer to examine UV-protection in native and exotic plants along an elevation gradient in Hawaii. It was during these measurements that Ron observed that the UV-shielding in the study plants

seemed to differ from morning to midday. This discovery led to the documentation that several plants in the Hawaiian alpine were indeed capable of diurnal changes in epidermal UV transmittance (P. W. Barnes et al. 2008). Subsequent studies have now demonstrated that these rapid adjustments in UV-sunscreen protection are widespread among plants and are not restricted to those growing in high UV environments (Barnes, Flint, et al. 2016; Barnes, Tobler, et al. 2016).

Ron was enthusiastic and passionate about his research but he was also an avid birder, a competitive runner and table tennis player, a skier, hiker, biker and river rafter. He had a special gift for interacting with people from all walks of life and continually sought to relate his research to broader questions of natural resource management, ecological theory and global and regional environmental prob-

lems. We remember Ron not only for his numerous scientific accomplishments but also his love of the outdoors, his adventuresome spirit and his courage and optimism as he battled his disease. The *Ronald J. Ryel Natural Resource Conservancy Scholarship* was established in 2014 at Utah State University to provide educational support for students who intend to become natural resource professionals in an agency or non-governmental organization (https://qcnr.usu.edu/scholarships/ron_ryel).

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