**RUSSELL BRIAN MUNTIFERING**

**Professor Emeritus**

Department of Animal Sciences, Auburn University

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**a. Professional Preparation**

B.S., 1973 University of California at Davis (Wildlife, Fisheries & Conservation

Biology

M.S., 1975 University of California at Davis (Nutrition)

Ph.D., 1980 University of Arizona (Agricultural Biochemistry & Nutrition)

**b. Appointments**

1997-2021 Professor, Department of Animal Sciences, Auburn University — 50% research, 50% teaching

1990-1997 Associate Director, Alabama Agricultural Experiment Station; Associate

Professor, then Professor (promoted in 1994), Department of Animal Sciences, Auburn University — 100% administration

1988-1990 Associate Director, Montana Agricultural Experiment Station, Montana State University, College of Agriculture; and Associate Professor, Department of Animal and Range Sciences — 85% administration, 15% research

1980-1988 Assistant, then Associate Professor (promoted with tenure in 1985),

Department of Animal Sciences, University of Kentucky — 65% research,

35% teaching

**c. Publications** (80+ papers, Total citation: 2,403; h-index: 25, Google Scholar, by Feb. 2024)

***(i) Five Most Closely Relevant Publications:***

Sanz J., I. González-Fernández, S. Elvira, **R. Muntifering**, R. Alonso and V. Bermejo-Bermejo.

2016. Setting ozone critical levels for annual Mediterranean pasture species: Combined analysis of open-top chamber experiments. Science of the Total Environment: 571: 670-79.

Booker, F., **R. Muntifering**, K. Burkey, W. Manning, D. Grantz, M. McGrath, A. Chappelka and

S. Krupa. 2009. The ozone component of global change: Effects on agricultural and horticultural plant yield, product quality and interactions with invasive species. Journal of Integrative Plant Biology 51: 337–351. (***invited contribution***).

Högy, P., H. Weiser, K. Schwadorf, J. Breurer, J. Franzaring, **R. Muntifering** and A. Fangmeier.

2009. Effects of elevated CO2 on grain yield and quality of wheat: results from a three-

year FACE experiment. Plant Biology 11: 60-69.

González-Fernández, I., D. Bass, **R. Muntifering**, G. Mills and J. Barnes. 2008. Impacts of

ozone pollution on productivity and forage quality of grass/clover swards. Atmospheric Environment 42: 8755–8769.

**Muntifering, R.B**., A.H. Chappelka, J.C. Lin, D.F. Karnosky and G.L. Somers. 2006. Chemical

composition and digestibility of Trifolium exposed to elevated ozone and carbon dioxide in a free-air (FACE) fumigation system. Functional Ecology 20: 269–275.

***(ii) Five Other Significant Publications***

Gilliland, N., A. Chappelka, **R. Muntifering** and S. Ditchkoff. 2015. Changes in Southern

Piedmont grassland community structure and nutritive quality with future climate scenarios of elevated tropospheric ozone and altered rainfall patterns. Plant Biology 18 (Suppl. 1): 47-55. (***invited contribution to Special Issue on Plants and the Changing Environment***).

Gilliland, N.J., A.H. Chappelka, **R.B. Muntifering**, F.L. Booker and S.S. Ditchkoff. 2012.

Digestive utilization of ozone-exposed forage by rabbits (*Oryctolagus cuniculus*).

Environmental Pollution 163: 281-286.

Lin, J.C., M. Nosal, **R.B. Muntifering** and S.V Krupa. 2007. Alfalfa nutritive quality for

ruminant livestock as influenced by ambient air quality in west-central Alberta.

Environmental Pollution 149: 99-103.

Bender, J., **R. Muntifering**, J. Lin and H. Weigel. 2006. Growth and nutritive quality of *Poa*

*pratensis* as influenced by ozone and competition. Environmental Pollution 142: 109-

115.

Krupa, S.V., **Muntifering, R.** & Chappelka, A.H. 2004. Effects of ozone on plant nutritive

quality characteristics for ruminant animals. The Botanica 54: 129-140. (***invited contribution***).

**d. Synergistic Activities**

European Commission - Fifth Framework Programme of the European Union, *Biodiversity in*

*Herbaceous Semi-Natural Ecosystems under Stress by Global Change Components*

(BIOSTRESS)

Board of Representatives, Council of Agricultural Science and Technology (Committee on

Animal Agriculture and Environmental Issues)

USDA National Research Support Program-9, *Defining Animal Nutrition Research Priorities for*

*a Healthy Society*

USDA Multistate Research Coordinating and Information Exchange Group NECC 1013,

*Strategies to Evaluate and Mitigate Ozone Impacts on Structure and Function of*

*Vegetation*

**e. Collaborators & Other affiliations**

*i.* The near-term goal of our collaborative research program in climate change between the Department of Animal Sciences and School of Forestry & Wildlife Sciences (A.H. Chappelka and S.S. Ditchkoff) is to better understand how nutritive quality of herbaceous vegetation of mammalian herbivores, primarily ruminant animals of agricultural importance, is affected by alterations in plant cell-wall composition and secondary chemistry resulting from exposure to phytotoxic concentrations of tropospheric (i.e., ground-level) ozone (O3). For well over a decade, we have collaborated extensively with US, Canadian and European centers of excellence on a variety of vegetation types (native C4 grasses, warm season- and cool season-adapted legumes, and improved C3 grasses) and growth habits (annual and perennial) using diverse experimental systems (continuous stirred-tank reactors, open-top chambers and free-air systems) at different levels of ecological organization (individual plants, in situ constructed plant communities,

extensively managed semi-natural grasslands, wild plant populations and intensively managed

agricultural cropland). Furthermore, we have investigated interactive effects of O3 with plant competition, N fertilization/deposition, and both ambient and elevated levels of other naturally occurring and anthropogenic air pollutants (CO2, SO2, NO*x*). A long-term goal of our research program is to relate changes in developmental plant biochemistry and physiology to alterations in interspecific plant relationships, nutritive quality, herbivory, organic matter and litter decomposition, and nutrient cycling dynamics of O3-exposed natural grasslands and improved pasturelands managed for biomass production, wildlife food/habitat and forage production for domestic-livestock feeding/grazing, and how these might be modulated by rainfall amounts/patterns and changes in physical climate. Ultimately, we endeavor to conduct controlled-environment experiments with large ruminant animals (e.g., sheep, cattle) in open-top

chambers and free-air systems, and incorporate data from these into landscape-level process models that are currently being developed at Auburn University and elsewhere.

*ii. Thesis/Dissertation Advisor*

Major professor or co-major professor of 7 doctoral and 20 master’s students' programs, and member of advisory committee for 19 doctoral and 45 master’s programs completed.