

RUSSELL BRIAN MUNTIFERING

Professor and Graduate Program Coordinator

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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-present 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 (Out of 60+ papers, Total citation: 1,056; h-index: 19, Google Scholar, By Feb. 2015)

(i) Five Most Closely Relevant Publications:

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.

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*).

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.

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*).

(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* (Accepted).

- Sanz, J. H. Calvete-Sogo, I. González-Fernández, J. Lin, H. García-Gómez, **R. Muntifering**, R. Alonso and V. Bermejo-Bermejo. 2015. Foliar senescence is the most sensitive response to ozone in *Bromus hordeaceus* and is modulated by nitrogen input. *Grass and Forage Science* 69: (In Press).
- Sanz, J., I. Gonzalez-Fernandez, H. Calvete-Sogo, J.C. Lin, R. Alonso, **R. Muntifering** and V. Bermejo. 2014. Ozone and nitrogen effects on yield and nutritive quality of the annual legume *Trifolium cherleri*. *Atmospheric Environment* 94: 765-772.
- 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.

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*

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 4 doctoral and 16 master's students' programs completed, and 1 doctoral and 2 master's programs in progress; member of advisory committee for 15 doctoral and 30 master's students' programs completed; and 3 master's and 2 doctoral programs in progress