

RICHARD H. GRANT, Professor of Agro-micrometeorology, Department of Agronomy, Purdue University

Education

B.S.	1977	Duke University (Distinction)	1974-1977
M.F.S.	1979	Yale University, School of Forestry and Environmental Studies	1977-1979
Ph.D.	1982	State University of New York, College of Environmental Science and Forestry	1979-1982

Language Ability

English	Native speaker
German	Minimum Professional Proficiency

Professional Experience

1982-1984	Post Doctoral Associate, State University of New York, College of Environmental Science and Forestry.
1984-1985	Research Assistant Professor, State University of New York, College of Environmental Science and Forestry.
1985-1992	Assistant Professor, Purdue University.
1992-1998	Associate Professor, Purdue University.
1994-1995	Visiting Professor, Institute of Meteorology and Physics, Agricultural University of Austria, Vienna, Austria.
1998-present	Professor, Purdue University
2000	Visiting Researcher, Colorado State University, UVB Monitoring Program, Fort Collins, CO, USA.
2010	Visiting Researcher, Institute for Meteorology and Climatology Research, Atmospheric Environmental Research Division, Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany.
2011	Visiting Scientist, Emissions Characterization and Prevention Branch, Office of Research and Development, National Risk Management Research Laboratory, US Environmental Protection Agency, Research Triangle Park, NC, USA.
2014	Adjunct Professor, St. Joseph College, Rensselaer, IN

Teaching Experience

- Undergraduate/Graduate dual level courses: Boundary Layer Meteorology (8 yrs), Environmental Biophysics (21 yrs), Operational Meteorology (1 yr), and Climate Change in Africa seminar (3 yrs).
- Undergraduate level courses: Senior seminar (1 yr), introductory Weather and Climate (20 yrs).
- Graduate level courses: Micrometeorology (7 yrs), Forensic Climatology (1 yr.), Greenhouse Gas Measurement (1 yr), and graduate seminar in reading scientific literature (1 yr).
- International Graduate/Professional workshop courses: Measuring Greenhouse Gases in Agriculture, Postgraduate College, Mexico (2009, 2012); Observations and experimental methods in an inhomogeneous atmosphere, Institute for Meteorology and Climatology Research, Atmospheric Environmental Research Division, Karlsruhe Institute of Technology, Germany (2013); Climate and climate change in Guinea, Advanced Institute for Agronomy and Veterinary Science, Guinea (2014)

Memberships in Academic, Professional and Scholarly Societies

American Geophysical Union	American Meteorological Society
American Society of Agronomy	Air and Waste Management Association
Sigma Xi honorary research Society	Gamma Sigma Delta honorary agriculture research Society

Award and Honors

2001	Certificate of Excellence, Educational Materials Award, American Society of Agronomy
2004	Dean's Team Award, "Agricultural Air Quality Team", Purdue University College of Agriculture
2007	Bronze Acorn Award, Purdue University
2007	Millionaires Club, Purdue University College of Agriculture
2010	Fellow, Helmholtz Association, Karlsruhe Institute of Technology, Karlsruhe, Germany
2012	Distinguished Professor, Mexico Academy of Sciences, Mexico City, Mexico
2012	Outstanding Academic Counselor, Purdue University Department of Agronomy
2013	Fellow, Committee on Institutional Cooperation Academic Leadership Program, Purdue University

National and International offices held

- Acting Executive Director, Pinchot Institute Consortium for Environmental Forestry Studies, 1983
- Member, American Meteorological Society (AMS) Comm. on Biometeorology and Aerobiology, 1986-1988.
- Chair, USDA Cooperative States Research, Education, and Extension Service (CSREES) NE160 Regional Research Committee “Impact of Climatic Variability on Agriculture”, 1989-1990.
- Member, Centennial Cooperative Weather Station Comm. organized jointly by the National Oceanic and Atmospheric Admin. and the USDA CSREES, 1989-1990.
- Chair, Agriculture, Forest, and Climate Study Group, Int. Society of Biometeorology, 1990-1999.
- Chair, USDA CSREES NC94 Regional Research Committee “Impact of Climate and Soils on Crop selection and management”, 1992-1994.
- Associate Editor, Editorial Board of the *International Journal of Biometeorology*, 1994-2004.
- Chair, UVB Effects Study Group, Int. Society of Biometeorology, 1999-2002.
- Chair, National Atmospheric Deposition Program (USA), 1995-1996, 2002-2003.
- Panel member, Air, Soil, Water Small Business Innovation Research Program, USDA CSREES, 1997
- Program Manager, Air, Soil, Water Small Business Innovation Research Program, USDA CSREES, 1998
- Panel member, University of Nebraska Natural Resources PhD Program review, 2000
- Panel member, UVB Monitoring Program USDA CSREES 5-yr review, 2001
- Member, National Atmospheric Deposition Program Executive Committee (USA), 2004-present
- Guest co-editor, Ultraviolet Radiation and its impacts on forests and forests, *Agricultural and Forest Meteorol.*, 2003.
- Chair, Board of Directors, Global Involvement through Education (NGO), 2004-2010
- Member, Animal Agriculture Working Group, Technical Guidelines and Scientific Methods for Quantifying GHG Emissions and carbon sequestration for Agricultural and Forestry Activities, USDA Climate Change Program Office, 2011-2014
- President, Global Involvement through Education (NGO), 2011-present
- Director, George Washington Academy (Moroccan NGO), 2012-present
- Member, AMS Comm. on Atmospheric Biogeosciences, 2013-present.
- Scientific Peer Review, USDA UV-B Monitoring and Research Program (UVMRP), 2013, 2015
- Panel member, National Atmospheric Deposition Program USDA NRSP 5-yr review, 2013
- Member, AMS Outstanding Achievements in Biometeorology Award Committee, 2015

University/ College Committee activity

Grade Appeals Committee, Purdue University College of Agriculture, 1991-1993

Grievance Committee, Purdue University College of Agriculture, 1994

Curriculum and Student Relations Committee, Purdue University College of Agriculture, 2003-2006

Executive Committee, Purdue Climate Change Research Center, Purdue University, 2004-2012

Honors Program Committee, Purdue University College of Agriculture, 2013-2014

Graduate Council, Purdue University College of Agriculture, 2014-present

International travel experience

Single trips: Australia, Czech Republic, Croatia, Guinea, Hungary, India, Ireland, Italy, Japan, Kenya, Kyrgyzstan, Netherlands, Oman, Papua New Guinea, Peoples Republic of China, Puerto Rico, Scotland, Singapore, Slovakia, Tajikistan, Tunisia, Uzbekistan

Multiple trips: Austria, Canada, Egypt, England, France, Germany, Kazakhstan, Mauritania, Mexico, Morocco, Russia, Slovenia, Turkey, United Arab Emirates, Yemen

Consulting experience

1. 1982-85. Allied Corp., Reports: Statistical noise study of the Jamesville Quarry, Nedrow, NY, Administrative court (Defendant side)
2. 1984-85. W.A. Aggregates, Inc., Report and testimony: Statistical noise study of the Clark-Dunn minesite, Pheonix, NY, Administrative court hearing, (Defendant side)
3. 1990. Baker and Daniels, Indianapolis, IN, Report: Winds and precipitation modeling for emission from a settling pond, Griffin Industries, Newbury, Indiana (Defendant side)
4. 1994. Indiana Gas, Inc, Report: Prediction of heating degree days at Indianapolis IN and Louisville KY.

5. 1994. Subcontract with Neal Haskell, Rensselaer IN, Report: Analysis of temperature climate for a homicide, Buttonville, Ontario, Canada, Province of Ontario vs. Singh (Prosecution side)
6. 1995. Subcontract with Neal Haskell, Rensselaer IN, Report: Analysis of temperature climate for a homicide in a creek valley, Putnam Co, IN, State of Indiana vs. Stevens (Prosecution side)
7. 1997. Subcontract with Neal Haskell, Rensselaer IN, Report: Evaluation of the temperature microclimate for a multiple homicide involving development of house temperature model within a mountain forest, Torreon, NM, State of New Mexico vs. Nieto (Prosecution side)
8. 1997. Subcontract with Neal Haskell, Rensselaer IN, Provision of hourly Lumberton, NC climate information for a homicide, (Prosecution side)
9. 1998. Johnson and Bell, Ltd., Report: Evaluation of the occurrence of dew for an insurance claim, Hammond, IN, (Defendant side)
10. 2003. City of Chicago Office of Law, Chicago, IL, Affidavit and deposition: Evaluation of the temperature microclimate for a homicide involving development of house temperature model, Chicago, IL, Castillo vs. City of Chicago (Defendant side)
11. 2005. David Hennessy, Attorney at Law, Report: Assessment of light levels at dusk in Indianapolis for a breaking and enter, IN, Indiana vs. Weaver (Defendant side)
12. 2009. Subcontract with Neal Haskell, Rensselaer IN, Affidavit: Evaluation and analysis of temperature evidence for a multiple homicide, Willis vs. State of Tennessee (Defendant side)
13. 2011-12. Montgomery County District Attorney Office, Conroe, Texas, Report and testimony: Evaluation and modeling of a forest temperature microclimate for a homicide, Appeal of State of Texas vs. Swearingen (Appellee side)
14. 2015. Franklin Conty District Attorney Office, Ottawa, Kansas. Report: Evaluation of temperature environment at 3197 Georgia Rd, Ottawa, KS (Prosecution side)

Research funding

Total research funding (as of 9/2014) of \$16.0M, of which \$6.0M is/ has been under my control.

Current funding for my laboratory (2015): \$50K.

Research citation ranking (as of June 2015)

ResearchGate score: 34.01 (1,054 publication downloads)

Google Scholar: h-index: 24, i10index: 50, 1780 citations

Web of Science: h-index: 17, 849 citations

Refereed Journal Papers

1. Grant, R.H. 1983. The scaling of flow in vegetative structures. *Boundary-Layer Meteorol.* 27:171-184.
2. Grant, R.H. 1984. The mutual interference of spruce canopy structural elements. *Agric. Forest Meteorol.* 32:145-156.
3. Grant, R.H.; G.E. Bertolin; and L.P. Herrington. 1985. Intermittent heat flux over a spruce forest canopy. *Boundary-Layer Meteorol.* 35:317-330.
4. Grant, R.H. 1985. The influence of the physical attributes of a shoot on momentum transfer. *Agric. Forest Meteorol.* 36:7-18.
5. Grant, R.H. 1985. The influence of the sky radiance distribution on the flux density in the shadow of a tree crown. *Agric. Forest Meteorol.* 35:59-70.
6. Gorres, J; R. Grant; T. Cresson; and P. Luner. 1986. The effect of drainage on randomly formed papers: a simulation study. *Tappi J.* 69:104-105.
7. Grant, R.H. 1987. Atmospheric wet deposition relationships to season and precipitation in SW Indiana. *Proc. Indiana Acad. Sciences.* 97:497-508.
8. Grant, R.H. 1988. Interactions between summer storms and photochemical air quality in SW Indiana. *Proc. Indiana Acad. Sciences.* 98:473-483.
9. Grant, R.H. and K. Seevers. 1989. Local and long range movement of adult western corn rootworm (*Diabrotica virgifera virgifera*) as evidenced by washup along southern Lake Michigan shores. *Environ. Entom.* 18:266-272.
10. Grant, R.H.; G.M. Heisler and L.P. Herrington. 1989. Evaluation of a technique to identify windy locations in urban areas. *J. Indust. Aerodyn. Wind Eng.* 31:335-341
11. Grant, R.H. and W.W. McFee. 1989. The relationship between Cl, Na and SO₄ particulate concentrations and air masses. *J. Appl. Meteorol.* 28:185-193.

12. Grant, R.H. and K.S. Seevers. 1990. The vertical movement of adult Western Corn Rootworm (*Diabrotica virgifera virgifera*) relative to the transport of momentum and heat. *Agric. and Forest Meteorol.* 49:191-203
13. Grant, R.H. 1991. Ultraviolet and photosynthetically active bands: plane surface irradiance at corn canopy base. *Agron. J.* 83:391-396.
14. Flesch, T.K. and R.H. Grant. 1991. The translation of wind energy to corn motion during senescence. *Boundary-Layer Meteorol.* 55:161-176.
15. Scheidt, A.B.; L.R. Rueff; R.H. Grant; L.K. Clark; M.A. Hill and R.F. Teclaw. 1991. Epizootic of pseudorabies among 10 swine herds. *J. Am. Vet. Med. Assoc.* 199:725-730.
16. Flesch, T.K. and R.H. Grant. 1992. Wind flow within open-top growth chambers and the gas exchange implications. *J. Environ. Qual.* 21(1):49-56.
17. Flesch, T.K. and R.H. Grant. 1992. Corn motion in the wind during senescence, I. motion characteristics. *Agron. J.* 84:742-747.
18. Flesch, T.K. and R.H. Grant. 1992. Corn motion in the wind during senescence, II. effect of dynamic plant characteristics. *Agron. J.* 84:748-751.
19. Grant, R.H.; Scheidt, A.B. and L.R. Rueff. 1994. Aerosol transmission of a viable virus affecting swine: an explanation of an epizootic of pseudorabies. *Int. J. Biometeorol.* 38:33-39
20. Grant, R.H.; M. Jenks; P. Peters and E. Ashworth. 1995. Scattering of ultraviolet and photosynthetically active radiation by sorghum bicolor: influence of epicuticular wax. *Agric. Forest Meteorol.* 75:263-281
21. Grant, R.H. and G.M. Heisler. 1996. Solar ultraviolet-B and photosynthetically-active irradiance in the urban sub-canopy: a survey of influences. *Int. J. Biometeorol.* 39:201-212.
22. Grant, R.H.; W. Gao and G.M. Heisler. 1996. Photosynthetically-active radiation: sky radiance distributions under clear and overcast conditions. *Agric. Forest Meteorol.* 82:267-292.
23. Grant, R.H.; G.M. Heisler, and W. Gao. 1996. Clear sky radiance distributions in ultraviolet wavelength bands. *J. Theor. Appl. Climatol.* 56:123-135.
24. Grant, R.H. 1997. The partitioning of biologically-active radiation in plant canopies. *Int. J. Biometeorol.* 40:26-40.
25. McPherson, E.G.; D. Nowak; G. Heisler; S. Grimmond; C. Souch; R. Grant and R. Rowntree. 1997. Quantifying urban forest structure, function and value: The Chicago Urban Forest Climate project. *Urban Ecosystems* 1: 49-61.
26. Grant, R.H. 1997. Biologically-active radiation in the vicinity of a single tree. *Photochem. Photobiol.* 65:974-982
27. Grant, R.H.; G.M. Heisler and W. Gao. 1997. Ultraviolet sky radiance distributions of translucent overcast skies. *J. Theor. Appl. Climatol.* 58:129-139.
28. Grant, R.H. 1997. Shadow-band corrections for photosynthetically -active radiation measurements under clear and overcast conditions. *Agric. Forest Meteorol.* 87:213-222.
29. Grant, R.H. and G.M. Heisler. 1997. Obscured overcast sky radiance distributions for the ultraviolet and photosynthetically-active radiation wavebands. *J. Appl. Meteorol.* 36:1336-1345.
30. Grant, R.H. 1998. Ultraviolet irradiance of inclined planes at the top of plant canopies. *Agric. Forest Meteorol.* 89: 281-293.
31. Grant, R.H. and K.L. Wong. 1999. Ozone profiles over a suburban neighborhood. *Atmos. Environ.* 33: 51-63.
32. Grant, R.H. 1999. Ultraviolet-B and photosynthetically active radiation environment of inclined leaf surfaces in a maize canopy. *Agric. Forest Meteorol.* 95:187-201.
33. Grant, R.H. 1999. Potential effect of soybean heliotropism on ultraviolet-B irradiance and dose. *Agron. J.* 91:1017-1023
34. Grant, R.H. and G.M. Heisler. 2000. Estimation of ultraviolet-B radiant flux density under variable cloud conditions. *J. Appl. Meteorol.* 39:904-916.
35. O'Neal, M.R.; J.R. Frankenberger; D.R. Ess and R.H. Grant. 2000. Precipitation variability at the farm scale during crop phenological stages. *Trans., Amer. Soc. Agric. Engineers* 43:1449-1458.
36. Heisler, G.M. and R.H. Grant. 2000. Ultraviolet radiation in urban ecosystems with consideration of effects on human health. *Urban Ecosys.* 4: 195-231.
37. Grant, R.H. and G.M. Heisler. 2001. Multi-spectral solar irradiance on tree-shaded vertical and horizontal surfaces: cloud-free and partly-cloudy skies. *Photochem. Photobiol.* 73:24-31.
38. Grant, R.H.; G.M. Heisler and W. Gao. 2002. Estimation of pedestrian level UV exposure under trees. *Photochem. Photobiol.* 75:369-376.
39. Gao, W.; R.H. Grant and G.M. Heisler. 2002. A geometric UV-B radiation transfer model applied to agricultural vegetation canopies. *Agron. J.* 94:475-482.
40. Grant, R.H. and K.L. Scheeringa. 2002. Estimating climate effects on the atmospheric contribution to potential available inorganic nitrogen in Eastern United States soils. *Atmos. Environ.* 36 :1619-1630

41. Grant, R.H. and W. Gao. 2003. Diffuse fraction of UV radiation under partly cloudy skies. *J. Geophysical Research* 108, D2, doi: 10.1029/2002JD002201
42. Grant, R.H. and J. Slusser. 2003. Interpolation of UVB radiation across the contiguous US. *Theor. Appl. Climatol.* 74:167-177, doi: 10.1007/s00704-002-0719-z
43. Grant, R.H.; W. Gao; M. Jenks and G.M. Heisler. 2003. Ultraviolet leaf reflectance of common urban trees and the prediction of reflectance from leaf surface characteristics. *Agric. Forest Meteorol.* 120: 127-139.
44. Bawhey, C.I. and R.H. Grant. 2003. Approaches to estimating soybean cultivar exposure to ambient radiation. *Agric. Forest Meteorol.* 120: 161-175
45. Gao, W.; R.H. Grant; G.M. Heisler and J.R. Slusser. 2003. Ultraviolet-B Radiation in a Row-crop Canopy: An extended 1-D Model. *Agric. Forest Meteorol.* 120: 141-151.
46. Heisler, G.M.; R.H. Grant and W. Gao 2003. Individual and scattered tree influences on ultraviolet irradiance. *Agric. Forest Meteorol.* 120: 113-126
47. Zheng, Y.; W. Gao; J.R. Slusser; R.H. Grant and C. Wang. 2003. Winter wheat response to enhanced solar ultraviolet radiation. *Agric. Forest Meteorol.* 120: 279-283.
48. Heisler, G.M.; R.H. Grant; W. Gao and J. Slusser. 2003. Ultraviolet radiation and its impacts on agriculture and forests: Forward. *Agric. Forest Meteorol.* 120: 3-7.
49. Grant, R.H. and J.R. Slusser. 2004. Estimation of photosynthetic photon flux density from 368 nm spectral irradiance. *J. Atmos. Ocean Technol.* 21: 481-487.
50. Gao, W.; Y. Zheng; J. Slusser; G. Heisler; R. Grant; J. Xu; and D. He. 2004. Effects of supplementary ultraviolet-B irradiance on maize yield and qualities: a field experiment. *Photochem. Photobiol.* 80:127-131.
51. Grant, R.H.; S.E. Hollinger; K.G. Hubbard; G. Hoogenboom and R.L. Vanderlip. 2004. Ability to predict daily solar radiation values from interpolated climate records for use in crop simulation models. *Agric. Forest Meteorol.* 127:65-75.
52. Heisler, G.M.; R.H. Grant; W. Gao and J.R. Slusser. 2004. Solar ultraviolet-B radiation in urban environments: The case of Baltimore. Maryland. *Photochem. Photobiol.* 80: 422-428.
53. Grant, R.H. and J.R. Slusser. 2005. High UVB exposures in the continental USA: towards realistic short term exposure regimes for plant effects research. *Photochem. Photobiol.* 81: 1038-1046.
54. Grant, R.H. and J.R. Slusser. 2005. Estimation of ultraviolet-A irradiance from measurements of 368-nm spectral irradiance. *J. Atmos. Ocean. Technol.* 22: 2853-2863.
55. Grant, R.H., K. Apostol, and W. Gao. 2005. Biologically effective UV-B exposures of an oak-hickory forest understory during leafout. *Agric. Forest Meteorol* 132: 28-43.
56. Grant, R.H. and G.M. Heisler. 2006. Effect of cloud cover on UVB exposure under tree canopies: will climate change affect UVB exposure? *Photochem. Photobiol.* 82: 487-494.
57. Schmitz, H.F. and R.H. Grant. 2009. Precipitation and Dew in a Soybean Canopy: Spatial Variations in Leaf Wetness and Implications for *Phakopsora pachyrhizi* Infection. *Agric. Forest Meteorol.* 149: 1621-1627, doi:10.1016/j.agrformet.2009.05.00.
58. Lawrence, A.F.; R.H. Grant; M.T. Boehm; A.J. Heber; J.M. Wolf; S.D. Cortus; B.W. Bogan; J.C. Ramirez-Dorransoro and C.A. Diehl. 2009. Measurements of air quality around various open area sources in USA. *Int. J. Civil Environ. Eng.* 1:195-198.
59. Schäfer, K.; R.H., Grant; S. Emeis; A. Raabe; C. von der Heide and H.P. Schmid. 2012. Areal-averaged trace gas emission rates from long-range open-path measurements in stable boundary layer conditions. *Atmos. Meas. Tech. Discussions* 5: 1–38, doi:10.5194/amtd-5-1-2012.
60. Ni, J.-Q. ; A.J. Heber; E.L. Cortus; T.T. Lim; B.W. Bogan; R.H. Grant and M.T. Boehm. 2012. Ammonia Emissions from Swine Facilities in the U.S.: Application of knowledge from experimental research. *Environ. Sci. Policy* 22: 25-35.
61. Schäfer, K.; R.H., Grant; S. Emeis; A. Raabe; C. von der Heide and H.P. Schmid. 2012. Areal-averaged trace gas emission rates from long-range open-path measurements in stable boundary layer conditions. *Atmos. Meas. Tech.* 5:1-13.
62. Grant, R.H.; M.T. Boehm and A.J. Lawrence. 2013. Comparison of backward-Lagrangian Stochastic and Vertical Radial Plume Mapping methods for estimating animal waste lagoon emissions. *Agric. Forest Meteorol.* 180: 236-248, doi:10.1016/j.agrformet.2013.06.013.
63. Grant, R.H.; M.T. Boehm; A.J. Lawrence and A.J. Heber. 2013. Ammonia Emissions from Anaerobic Treatment Lagoons at Sow and Finishing Farms in Oklahoma. *Agric. Forest Meteorol.* 180: 203-210, doi:10.1016/j.agrformet.2013.06.006.

64. Rotz, C.A.; F. Montes; S.D. Hafner; A.J. Heber and R.H. Grant. 2013. Ammonia Emission Model for Whole Farm Evaluation of Dairy Production Systems. *J. Environ. Qual.*, doi:10.2134/jeq2013.04.0121
65. Grant, R.H.; M.T. Boehm; A.J. Lawrence and A.J. Heber. 2013. Hydrogen sulfide emissions from sow farm lagoons along a climate continuum. *J. Environ. Qual.* 42:1674-1683, doi:10.2134/jeq2013.04.0115
66. Na, H.R.; G.M. Heisler; D.J. Nowak and R.H. Grant. 2014. Modeling of Urban Trees' Effects on Reducing Human Exposure to UV Radiation on a City-wide Scale: A Case Study of Seoul, Korea for i-Tree. *Urban Forests & Urban Greening* 13: 785-792, doi: 10.1016/j.ufug.2014.05.009
67. Grant, R.H. and M.T. Boehm. 2015. Manure NH₃ and H₂S emissions from a western dairy storage basin. *J. Environ. Qual.* 44:127-136, doi:10.2134/jeq2014.05.0196
68. Grant, R.H.; M.T. Boehm and B. Bogan 2015. Methane and carbon dioxide emissions from manure storage facilities at two free-stall dairies. *Agric. Forest Meteorol.* 213:102-113, doi:10.1016/j.agrformet.2015.06.008
69. Grant, R.H. and M.T. Boehm 2015. Inhomogeneity of methane emissions from a dairy waste lagoon. *J. Air Waste Management* doi: 10.1080/10962247.2015.1083912
70. Zhang, H.; J.-Q. Ni; L.H. Page; A.J. Heber; R.H. Grant; P.M. Ndegwa; H.-S. Joo and J.H. Harrison. 2014. Characteristics of releases of greenhouse gases, ammonia, and hydrogen sulfide from liquid dairy manure. *Biosystems Engineering*. (submitted)

Other Publications

1. Herrington, L.P. and R.H. Grant. 1982. *Wind tunnel evaluation of aerodynamic drag coefficients of spruce foliage elements*. Final Rpt., USDA Forest Service Northeast Forest Experiment Station project 23-180. SUNY-CESF. 40 p.
2. Grant, R.H. and L.P. Herrington. 1982,83,84,85. Semiannual report(s) of the *Jamesville Quarry Noise Study*. Reports to Allied Corp., Nedrow, NY. 15 p.
3. Gorres, J., P. Luner; and R. Grant. 1984. Simulation of paper structure using an image analysis system. pp 239-252 in *Research Report no. 80.*, Empire State Paper Research Institute., SUNY-CESF.
4. Grant, R.H.; L.P. Herrington; G.M. Heisler. 1984. *The simulation of radiant heat loading in the shadow of a tree*. Final Rpt., USDA Forest Service Northeast Forest Experiment Station project 23-702. 52 p.
5. Grant, R.H. 1984. *Statistical noise study of the Clark-Dunn minesite*. Report to W.A. Aggregates, Inc. Pheonix, NY. 10 p.
6. Grant, R.H. 1985. *Statistical noise study of the Clark-Dunn minesite*. Report to W.A. Aggregates, Inc. Pheonix, NY. 10 p.
7. Grant, R.H.; L.P. Herrington; and G.M. Heisler. 1985. *Test of the ability of a wind tunnel model to predict urban wind patterns*. Final Rpt., USDA Forest Service Northeast Forest Exp. Station project # 23- 599. 18p.
8. Grant, R.H. 1986. *The influence of the spatial pattern of vegetation on the Urban Heat Island*. Report to the U.S. Forest Service Northeast Forest Exp. Station. 20 p.
9. Grant, R.H. 1990. *Effects of vegetation on internal boundary layer profiles over suburban West Lafayette, Indiana*. Report to the U.S. Forest Service Northeast Forest Exp. Station project # 23-077. 22 p.
10. Westbrook, J.K.; D.M. Driscoll; R.H. Shaw; K.T. Paw U; R. Avissar; R.H. Grant; G.L. Hahn. 1992. Summary of the American Meteorological Society 10th Conference on Biometeorology and Aerobiology, 10-13 Sept. 1991, Salt Lake City, UT. *Bull. Amer Meteorological Soc.* 73: 473-476
11. Grant, R.H. 1993. Ultraviolet solar radiation: characterization and canopy distribution. p45-62 in (C. Varlet-Grancher, R. Bonhomme, & H. Sinoquet; eds.) *Crop structure and light microclimate: characterization and applications* INRA Editions, Versailles Cedex, France.
12. Grant, R.H. 1993. *Chicago, Ill climate and mesoclimate*. Report to the U.S. Forest Service Northeast Forest Exp. Station project # 23- 685, 33p.
13. Grant, R.H. 1994. *Prediction of subcanopy urban climates for Chicago Ill*. Final Rpt., USDA Forest Service Northeast Forest Exp. Station project # 23- 685. 44p
14. Grant, R.H. 1994 *UV irradiance measurements in urban environments. Sensor system response studies of the UVA and UVB irradiance sensor systems*. Rpt. to the US Forest Service Northeast Forest Exp. Station project #23-793.
15. Grimmond, S.; C. Souch; R.H. Grant; and G.M. Heisler. 1994. Local scale energy and water exchanges in a Chicago neighborhood. pp 41-62 in (McPherson, E.G.; D.J. Nowak; and R.A. Rowntree, eds.) *Chicago's Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project*. USDA-FS General Tech. Rpt. NE-186.
16. Heisler, G.M.; S. Grimmond; R.H. Grant; and C. Souch. 1994. Investigation of the influence of Chicago's Urban Forests on wind and air temperature within residential neighborhoods. pp 19-40 In (McPherson, E.G.; D.J. Nowak;

- and R.A. Rowntree, eds.) *Chicago's Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project*. USDA-FS General Tech. Rpt. NE-186.
17. Grant, R.H. and R. F. Dale. 1994. *Heating degree day forecasting at Indianapolis IN and Louisville KY*. Rpt to Indiana Gas, Inc., 20p.
 18. Heber, A.J.; T.T. Lim; J. Q. Ni; R.H. Grant and A.L. Sutton. 1999. Development of a Site-Specific Odor Impact Guideline for Swine Production Systems, NPB # 98-131.
 19. Heisler, G.M. and R.H. Grant. 2000. *Ultraviolet radiation, human health, and the urban forest*. Northeastern Experiment Station, USDA Forest Service. USDA-FS General Tech. Rpt. NE-268.
 20. O'Neal, M., J. Frankenberger, and R. Grant. 2000. Weather information systems for site-specific farming. pp. 116-124 In: J. Lowenberg-DeeBoer (Ed.) " *Precision Farming Profitability*", Agricultural Research Program, Purdue University, SSM-3.
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