

Curriculum Vitae
Arthur G. Appel
Department of Entomology and Plant Pathology
College of Agriculture
Alabama Agricultural Experiment Station
Auburn University

Current Appointment: Tenured, 12-month. Graduate Faculty Status: Level 2, doctoral directing.

Education:

Institution	Degree	Major	Date Awarded
University of California, Riverside	Ph.D.	Urban Entomology (Insect physiology and parasitology minors)	1985
University of California, Riverside	M.S.	Urban Entomology	1982
University of California, Los Angeles	B.A.	Biology (Philosophy minor)	1980

Professional experience:

Institution	Rank	Period of Appointment
Auburn University	Faculty Endowed Professor (termed)	October 2019 – September 2022
	Interim Dean and Director	July 2015 – February 2016
		January 2025 - present
	Interim Associate Dean and Assistant Director	January 2014 – July 2015; February – March 2016; June 2021 – March 2022
	Associate Dean and Associate Director	April 2022 – January 2025
	Department Chair	November 2005 – January 2014
	Alumni Professor	October 2001 – 2006
	Professor	October 1997 – present
	Associate Professor with tenure	October 1990 – September 1997
	Assistant Professor	March 1985 – September 1990

Percentage appointments:

Teaching: 25%; Research: 75%; Extension: 0% (March 2016 – June 2021)

Administration: 100% (January 2014 – March 2016; April 2022 – present)

Teaching: 35%; Research: 35%; Extension: 30% (1 November 2005 – January 2014)

Teaching: 20%; Research: 80%; Extension: 0% (1 November 1996 - 2005)

Teaching: 55%; Research: 45%; Extension: 0% (1 March 1985 - 31 October 1996)

Areas of expertise: Urban entomology and physiological ecology of invertebrates.

Honors and awards:

- Fellow, Royal Entomological Society, 2017.
- Fellow, American Association for the Advancement of Science, 2015.
- Member, Editorial Board, Insects, MDPI, 2018.
- Member, Editorial Board of Physiological Entomology, Royal Entomological Society, 2017.
- Opening (Keynote) lecture, invited speaker, 44th Annual Meeting of the Organization of Nematologists of Tropical America (ONTA), Cancun, Mexico, 2012. Why not agriculture? Perceptions, reality, and the future.
- Visiting Professor, Yangtze University, Jingzhou, Hubei, China (2009-2012), 2009.
- Honorary Professor, Southwest University, Chongqing, China, 2009.
- ESA Recognition Award in Urban Entomology, Southeastern Branch, Entomological Society of America, 2008.
- Entomological Foundation, Recognition Award in Urban Entomology (sponsored by S.C. Johnson & Sons), presented at the national meeting of the Entomological Society of America, San Diego, CA, 2007.
- Auburn University Alumni Professorship, October 2001-2006.

- Keynote invited speaker, joint meeting of the Pest Control Association of Malaysia and the Singapore Pest Management Association, Langkawi, Malaysia, 2003. Global innovations and modern techniques for urban pest managers.
- Subject Editor for Household and Structural Insects, Journal of Economic Entomology, Entomological Society of America (2001-2006) and (2012-present, renewed until 2029).
- ESA Recognition Award in Urban Entomology, Southeastern Branch, Entomological Society of America, 1996.
- Chair, National Conference on Urban Entomology organizing committee, 1996-1998.
- Editor, Proceedings of the National Conference on Urban Entomology, 1996.
- Professional Improvement Leave, 1993, University of East Anglia, Norwich, England. Insect respiration and water relations research with Dr. John Noble-Nesbitt.
- ESA Recognition Award in Urban Entomology, Southeastern Branch, Entomological Society of America, 1993.
- Invitation to become a faculty member in the Human Odyssey Program for Academic years 1993-94, 1994-95, and 2004-2005, the only multidisciplinary science and humanities curriculum at Auburn University, faculty selected by special invitation.
- College of Agriculture, Auburn University, Dean's Award for Teaching Excellence, 1993.
- National Association of Colleges and Teachers of Agriculture, Teaching Award of Merit, teaching year of 1992-1993.
- Department of Entomology 1989, 1990, 1991, and 1992, and was a nominee for the Dean's Award for Teaching Excellence in the College of Agriculture, Auburn University.
- Department of Entomology 1990 nominee for the Director's Research Award, Alabama Agricultural Experiment Station, Auburn University.
- The Johnson's Wax Fund Research Fellowship, \$10,000 per year, 1988 and 1989.
- American Men & Women of Science, 1986.
- Outstanding Young Men of America, U. S. Jaycees annual award, 1983.
- Gamma Sigma Delta, The Honor Society of Agriculture, 1983.
- Sigma Xi, The Scientific Research Society, 1982.
- Dean's List, University of California, Los Angeles, 1977, 1980.

SCHOLARLY CONTRIBUTIONS

A. Teaching

1. Courses Taught:

- Urban Entomology; 5 credit hours, ENT 508
- Urban Entomology; 5 credit hours, ENT 608
- Urban Entomology; 4 credit hours, ENTM 6370
- Insects; 3 credit hours, ENT 204
- The Human Odyssey: Sciences and Humanities; 3 credit hours, U 270-271-272/ UNIV 2710-2720
- Honors Human Odyssey; 3 credit hours, U 280-281-282/ UNIV 2717-2727
- Research and Thesis; 2-5 credit hours, ENT 699/ ENTM 7970
- Research and Dissertation; 3-5 credit hours, ENT 799/ ENTM 8970

2. Graduate students whose work has been completed:

Master's Students (Major professor of 13; committee member of 20)

- a. R. C. Sponsler; M.S. degree; Entomology; Major Professor
- b. D. A. Oswald; M.S. degree; Entomology; Major Professor
- c. C. L. Mazer; M.S. degree; Entomology; Major Professor
- d. Edward T. Snoddy; M.S.; Entomology; Major Professor
- e. Alicia K. Phillips; M.S.; Entomology; Major Professor
- f. Hao Wu; M.S.; Entomology; Co-major professor with X. P. Hu

- g. Zachary DeVries; M.S. Entomology; Major Professor
- h. Xiaoyan Wu; M.S. Entomology; Major Professor
- i. Gökhan Bent; M.S.; Entomology; Co-major professor with X. P. Hu
- j. Madison K. Peterson; M.S.; Entomology; Co-major professor with X. P. Hu
- k. Festus K. Ajibefun; M.S.; Entomology; Co-major professor with X. P. Hu
- l. Alan Jeon; M.S.; Entomology
- m. M. Phelps Griffin; M.S.; Entomology; Co-major professor with X. P. Hu

Ph.D. Students (Major professor of 8; committee member of 27)

- A. S. F. Abd-Elghafar; Ph.D.; Entomology; Co-advisor with T.P. Mack;
- B. J.T. Vogt; Ph.D.; Entomology; Major Professor
- C. T. G. Shelton; Ph.D.; Entomology; Major Professor
- D. H. Hull-Sanders; Ph.D.; Entomology; Co-Major Professor with M.D. Eubanks
- E. Beatrice N. Dingha; Ph.D.; Entomology; Major Professor
- F. Edward T. Snoddy; Ph.D.; Entomology; Major Professor
- G. Seun Oladipupo; Ph.D.; Entomology; Co-major professor with X. P. Hu
- H. Chelsea M. Smith; Ph.D.; Entomology; Co-major professor with X. P. Hu

3. Graduate students whose work has not been completed:

- Kyle Oswalt; Ph.D.; Entomology; committee member
- Faith Boyer; Ph.D.; Biological Sciences; committee member
- Carla Guardado Martinez; M.S.; Poultry Science; committee member
- Ashmita Sapkota; M.S.; Entomology; chair

4. Courses and curricula developed:

- Insects, freshman-level general introduction to insect biology, ENT 204/2040
- General Entomology, first specialized entomology course, ENTM 3040
- Urban Entomology, graduate-level specialized course on household and structural pest biology and management, ENT 508/608; ENTM 6370

5. Publications pertaining to teaching:

- 1. **Appel, A. G.** 1984. Orientation and mating behavior in response to sex pheromone. *Anim. Behav. Soc. Newsletter* 29: 5.

6. Other Contributions to Teaching:

- a. Invited lectures, Auburn University courses (15)
- b. Other courses at external universities (22)

B. Research/Creative Work (* indicates student contribution)

1. Article-length publications:

a. Book Chapters

- 1. **Appel, A. G.** 2021. Biology, nutrition, and physiology. pp. 53-74. *In* Changlu Wang, Chow-Yang Lee, and Michael K. Rust (eds.), *Biology and Management of the German Cockroach*. CSIRO Publishing, Australia.
- 2. **Appel, A. G.**, and M. K. Rust. 2021. German cockroach management using baits. pp. 213-230. *In* Changlu Wang, Chow-Yang Lee, and Michael K. Rust (eds.), *Biology and Management of the German Cockroach*. CSIRO Publishing, Australia.
- 3. Sims, S. R., and **A. G. Appel**. 2016. Climate change and the new dynamics of urban pest management in North America, pp. 31-49. *In* Dhang, P. (ed.), *Climate Change Impact on Urban Pests*. CABI Oxford, U.K.

4. **Appel, A. G.** 2008. Behavioral and physiological aspects of energetics and respiration patterns of cockroaches, *In* Liu, N. (ed.), Recent advances in Insect Physiology, Toxicology and Molecular Biology.
5. **Appel, A. G.** 1995. *Blattella* and related species, Chapter 1, *In* Rust, M. K., J. M. Owens, and D. A. Reiersen, (eds.), Understanding and Controlling the German Cockroach. Oxford University Press, New York.

b. Articles Published in Refereed Journals

1. *Smith, C.M., H.Y. Fadamiro, and **A.G. Appel**. 2025. Host range of the oothecal parasitoid *Aprostocetus hagenowii* (Hymenoptera: Eulophidae). J. Insect Science 25: 2, ieaf001, 1-7. <https://doi.org/10.1093/jisesa/ieaf001>
2. Gordon, J. M., M. J. Eva, S. Gaire, **A. G. Appel**, and Z. C. DeVries. 2024. Common consumer residual insecticides lack efficacy against insecticide-susceptible and resistant populations of the German cockroach (Blattodea: Ectobiidae). J. Econ. Entomol. 117: DOI: 10.1093/jee/toae158
3. *Smith, C. M., M. P. Griffin, H. Y. Fadamiro, and **A. G. Appel**. 2024. Toxicity of cockroach gel baits to the oothecal parasitoid *Aprostocetus hagenowii* (Hymenoptera: Eulophidae) and implications for cockroach integrated pest management. J. Econ. Entomol. 117: DOI: 10.1093/jee/toae157.
4. Rivera-Rincon, N., U. H. Altindag, R. Amin, R. M. Graze, **A. G. Appel**, and L. S. Stevison. 2024. A comparison of thermal stress response between *Drosophila melanogaster* and *Drosophila pseudoobscura* reveals diverse patterns between species and sexes. J. Insect Physiol. 153: <https://doi.org/10.1016/j.jinsphys.2024.104616>.
5. *Peterson, M. K, X .P. Hu, and **A. G. Appel**. 2023. Differential development and survival of *Blattella asahinai* and *Blattella germanica* (Blattodea: Ectobiidae) at six constant temperatures. J. Econ. Entomol. 116: 1776-1786.
6. Oladipupo, S.O., Y. Laidoudi, J. F. Beckmann, X. P. Hu, and **A. G. Appel**. 2023. The prevalence of Wolbachia in multiple cockroach species and its implication for urban insect management. J. Econ. Entomol. 116: 1307-1316.
7. *Smith C. M., A. M. Chicas-Mosier, H. Y. Fadamiro, and **A. G. Appel**. 2023. Potential of the oothecal parasitoid *Aprostocetus hagenowii* (Hymenoptera: Eulophidae) as a biological control agent for the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). J. Econ. Entomol. 116: 1128-1136.
8. *Smith, C. M., A. M. Chicas-Mosier, **A. G. Appel**, and H. Y. Fadamiro. 2022. Gravid *Periplaneta americana* (Blattodea: Blattidae) fails to detect or respond to the presence of the oothecal parasitoid *Aprostocetus hagenowii* (Hymenoptera: Eulophidae). Environ. Entomol. 51: 1086-1093.
9. *Oladipupo, S. O., X. P. Hu, and **A. G. Appel**. 2022. Essential oils in urban insect management – a review. J. Econ. Entomol. 115: 1375-1408.
10. Niitepöld, K., H. A. Parry, N. R. Harris, **A. G. Appel**, J. de Roode, A. N. Kavazis, and W. R. Hood. 2022. Flying on empty: Reduced mitochondrial function and flight capacity in food-deprived monarch butterflies. J. Exp. Biol. 225 (13) <https://doi.org/10.1242/jeb.244431>
11. **Appel, A. G.**, B. N. Dingha, M. J. Eva, and L. E. N. Jackai. 2022. Toxicity, repellency, and laboratory performance of consumer bait products for German cockroach (Blattodea: Ectobiidae) management. Florida Entomologist. 105: 115-125.
12. *Oladipupo, S. O., A. E. Wilson, X. P. Hu, and **A. G. Appel**. 2022. Why do insects close their spiracles? A meta-analytic evaluation of the adaptive hypothesis of discontinuous gas exchange in insects. Insects. 13(2), 117; <https://doi.org/10.3390/insects13020117>.
13. Yihang, Z. Y. Wang, X. Xiong, **A. G. Appel**, C. Zhang, and X. Wang. 2022. Profiles of telomeric repeats in Insecta reveal diverse forms of telomeric motifs in Hymenopterans. Life Science Alliance. 5: 1-15 e202101163.
14. Gardner, S. T., **A. G. Appel**, and M. T. Mendonça. 2022. Chasing cane toads: assessing locomotive and behavioral changes from northward establishment in Florida. Herpetologica 78: 1-8.

15. Gondhalekar, A. D., **A. G. Appel**, G. M. Thomas, and A. Romero. 2021. A review of alternative management tactics employed for the control of various cockroach species (Order: Blattodea) in the USA. *Insects*. 12(6), 550; <https://doi.org/10.3390/insects12060550>.
16. *Oladipupo, S. O., X. P. Hu, and **A. G. Appel**. 2020. Essential oil components in superabsorbent polymer gel modify reproduction of *Blattella germanica* (L.) (Blattodea: Ectobiidae). *J. Econ. Entomol.* 113: 2436-2447.
17. *Benk, G., P. J. *Thompson, X. P. Hu, and **A. G. Appel**. 2020. Water loss and desiccation tolerance of the two yearly generations of adult and nymphal Kudzu bugs, *Megacopta cribraria* (Hemiptera: Plataspidae). *Environ. Entomol.* 49: 651-659.
18. Gardner, S. T., V. R. Assis, K. M. Smith, **A. G. Appel**, and M. T. Mendonça. 2020. Innate immunity of Florida cane toads: how dispersal has affected physiological responses to LPS. *Journal of Comparative Physiology B*. 190: 317-327.
19. Ajayi, O. S., **A. G. Appel**, L. Chen, and H. Y. Fadamiro. 2020. Comparative cutaneous water loss and desiccation tolerance of four *Solenopsis* spp. (Hymenoptera: Formicidae) in the southeastern United States: implications for distribution patterns. *Insects*. 2020, 11, 418; doi:10.3390/insects11070418
20. *Oladipupo, S. O., X. P. Hu, and **A. G. Appel**. 2020. Topical toxicity profiles of some aliphatic and aromatic essential oil components against insecticide-susceptible and resistant strains of German cockroach (Blattodea: Ectobiidae). *J. Econ Entomol.* 113: 896-904.
21. *Peterson, M. K., **A. G. Appel**, and X. P. Hu. 2019. Instar determination of *Blattella asahinai* (Blattodea: Ectobiidae) from digital measurements of the pronotum using Gaussian mixture modeling and the number of cercal annuli. *J. Entomol. Sci.* 19: 5; 1-14.
22. Quarcoo, F. Y., X. P. Hu, and **A. G. Appel**. 2019. Temperature-mediated variations in behavior and mortality caused by non-repellent insecticides in subterranean termites (Blattodea: Rhinotermitidae). *Insects*. 10(2), 37, 14 pp.
23. *Wu, X., and **A. G. Appel**. 2018. Repellency and laboratory performance of selected insecticides to field-collected insecticide resistant German cockroaches (Blattodea: Ectobiidae). *J. Econ. Entomol.* 111: 2788-2798.
24. Xu, M., Z. Lu, Y. Lu, R. R. Balusu, O. S. Ajayi, H. Y. Fadamiro, **A. G. Appel**, and L. Chen. 2018. Cuticular hydrocarbon chemistry, an important factor shaping the current distribution pattern of the imported fire ants in the USA. *J. Insect Physiol.* 110: 34-43
25. *Jeon, S. A., R. R. Balusu, L. Zhang, H. Y. Fadamiro, and **A. G. Appel**. 2018. First record of the field cockroach, *Blattella vaga* (Blattodea: Ectobiidae), from southern Alabama. *Florida Entomol.* 101: 109-112.
26. Goessling, J. M., M. T. Mendonça, and **A. G. Appel**. 2018. Assessment of seasonal metabolic acclimation in gopher tortoises (*Gopherus Polyphemus*): Does dormancy reduce metabolic rate? *Copeia* 106: 56-62.
27. Goetz, S. M., C. M. Romagosa, **A. G. Appel**, C. Guyer, and M. T. Mendonça. 2017. Reduced innate immunity of Cuban Tree frogs at leading edge of range expansion. *J. Exp. Zool. Part A*. 327(10):592-599. First published 12 March 2018.
28. Campbell, B. E., D. M. Miller, Z. C. DeVries, and **A. G. Appel**. 2017. Water loss and metabolic activity in bed bug eggs (*Cimex lectularius* L.). *Physiol. Entomol.* 42: 355–361.
29. *Wu, X., and **A. G. Appel**. 2017. Insecticide resistance of several field-collected German cockroach (Dictyoptera: Blattellidae) strains. *J. Econ. Entomol.* 110: 1203-1209.
30. *Wu, H., X. P. Hu, and **A. G. Appel**. 2017. Temperature-dependent development and thermal sensitivity of *Blaptica dubia* (Blattodea: Blaberidae). *J. Econ. Entomol.* 110: 546-551
31. Dingha, B. N., J. O'Neal, **A. G. Appel**, and L. E. N. Jackai. 2016. Integrated pest management of the German cockroach (Blattodea: Blattellidae) in manufactured homes in rural North Carolina. *Florida Entomol.* 99(4): 587-592.
32. *DeVries, Z. C., S. A. Kells, and **A. G. Appel**. 2016. Estimating the critical thermal maximum (CTmax) in bed bugs, *Cimex lectularius*: Comparing thermolimit respirometry with traditional visual methods. *Comp. Biochem. Physiol. A*. 197: 52-57.

33. *DeVries, Z. C., S. R. Kells, and **A. G. Appel**. 2015. Effects of starvation and molting on the metabolic rate of the bed bug (*Cimex lectularius*). *Physiological and Biochemical Zoology*. 88: 53-65.
34. *DeVries, Z. C., W. R. Reid, S. A. Kells, and **A. G. Appel**. 2015. Effects of starvation on deltamethrin tolerance in bed bugs, *Cimex lectularius* L. (Hemiptera: Cimicidae). *Insects*. 2015, 6: 102-111.
35. Olufunmilayo, E. Ajayi, **A. G. Appel**, and H. Y. Fadamiro. 2014. Phytotoxicity of some essential oil components to cowpea (*Vigna unguiculata* (L.) Walp.) seeds. *International Journal of Plant Biology and Research*. 2(4): 1024, 9 pp.
36. Olufunmilayo, E. Ajayi, **A. G. Appel**, and H. Y. Fadamiro. 2014. Fumigation toxicity of essential oil monoterpenes to *Callosobruchus maculatus* (Coleoptera: Chrysomelidae: Bruchinae). *J. Insects*. Volume 2014 (2014), Article ID 917212, 7 pages. <http://dx.doi.org/10.1155/2014/917212>.
37. Sims, S. R., R. R. Balusu, E. N. Ngumbi, and **A. G. Appel**. 2014. Topical and vapor toxicity of saturated fatty acids to the German cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 107: 758-763.
38. Liu, F., K. F. Haynes, **A. G. Appel**, and N. Liu. 2014. Antennal olfactory sensilla responses to insect chemical repellents in the common bed bug, *Cimex lectularius*. *J. Chem. Ecol.* 40: 522-533.
39. *Snoddy, E. T., and **A. G. Appel**. 2014. Field and laboratory efficacy of three insecticides for population management of the Asian cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 107: 326-332.
40. *DeVries, Z. C., and **A. G. Appel**. 2014. Effects of temperature on nutrient self-selection in the silverfish *Lepisma saccharina*. *Physiol. Entomol.* 39: 217-221. Article first published online: 2 JUL 2014 DOI: 10.1111/phen.12064
41. *DeVries, Z. C., S. A. Kells, and **A. G. Appel**. 2013. Standard metabolic rate of the bedbug, *Cimex lectularius*: Effects of temperature, mass, and life stage. *J. Insect Physiol.* 59: 1133-1139.
42. Liu, F., L. Chen, **A. G. Appel**, and N. Liu. 2013. Olfactory responses of the antennal trichoid sensilla to chemical repellents in the mosquito, *Culex quinquefasciatus*. *J. Insect Physiol.* 59: 1169-1177.
43. Peterson, J. D., J. E. Steffen, L. K. Reinert, P. A. Cobine, **A. Appel**, L. Rollins-Smith, and M. T. Mendonça. 2013. Host stress response is important for the pathogenesis of the deadly amphibian disease, Chytridiomycosis, in *Litoria caerulea*. *PLOS ONE* 8(4): e62146. doi:10.1371/journal.pone.0062146.
44. *Wu, H., **A. G. Appel**, and X. P. Hu. 2013. Instar determination of *Blaptica dubia* (Blattodea: Blaberidae) using Gaussian mixture models. *Ann. Entomol. Soc. Am.* 106: 323-328.
45. *Snoddy, E. T. and **A. G. Appel**. 2013. Mulch preferences of the Asian cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 106: 322-328.
46. *DeVries, Z. C. and **A. G. Appel**. 2013. Standard metabolic rates of *Lepisma saccharina* and *Thermobia domestica*: Effects of temperature and mass. *J. Insect Physiol.* 59: 638-645.
47. Sims, S. R., and **A. G. Appel**. 2012. Efficacy of commercial baits and new active ingredients against firebrats and silverfish ((Zygentoma: Lepismatidae). *J. Econ. Entomol.* 105: 1385-1391.
48. Quarcoo, F. Y., X. P. Hu, and **A. G. Appel**. 2012. Effects of non-repellent termiticides on the tunneling and walking ability of the eastern subterranean termite (Isoptera Rhinotermitidae). *Pest Management Science*. 68: 1352-1359.
49. Hu, J., Kok-Boon Neoh, **A. G. Appel**, and C.-Y. Lee. 2012. Subterranean termite open-air foraging and tolerance to desiccation: Comparative water relation physiology of two sympatric *Macrotermes* spp. (Blattodea: Termitidae). *Comp. Biochem. Physiol. A*. 161: 201-207.
50. **Appel, A. G.**, X. P. Hu, J. Zhou, Z. Qin, H. Zhu, X. Chang Z. Wang, X. Liu, and M. Liu. 2012. Observations on the biology and ecology of the black-winged termite, *Odontotermes formosanus* Shiraki, (Termitidae: Isoptera) in camphor, *Cinnamomum camphora* (L.) (Lauraceae) *Psyche* (2012), Article ID 123102, 5 pages doi:10.1155/2012/123102

51. Steffen, J.E. and **A. G. Appel**. 2012. The effect of temperature on standard metabolic rate of Brown Anoles. *Amphibia-Reptilia* 33: 297-302.
52. Malik, T. A., L. P. Luz, S. Peter, and **A. G. Appel**. 2011. Caught on camera: an unusual type of bug in the gut. *Gastrointestinal Endoscopy*. 73:363-364
53. Akotsen-Mensah, C., R. T. Boozer, **A. G. Appel**, and H.Y. Fadamiro. 2011. Seasonal occurrence and development of degree-day models for predicting activity of *Conotrachelus nenuphar* (Coleoptera: Curculionidae) in Alabama peaches. *Ann. Entomol. Soc. Am.* 104: 192-201.
54. *Phillips, A. K., and **A. G. Appel**. 2010. Fumigant toxicity of essential oils to the German cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 103: 781-790.
55. Sims, S. R., A. G. Appel, and M. J. Eva. 2010. Comparative toxicity and repellency of microencapsulated and other liquid insecticide formulations to the German cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 103: 2118-2125.
56. Quarcoo, F. Y., **A. G. Appel**, and X. P. Hu. 2010. Effects of indoxacarb concentration and exposure time on the onset of abnormal behaviors, morbidity, and death in the eastern subterranean termite (Isoptera: Rhinotermitidae). *J. Econ. Entomol.* 103: 762-769.
57. Quarcoo, F. Y., **A. G. Appel**, and X. P. Hu. 2010. Descriptive study of non-repellent insecticide-induced behaviors in *Reticulitermes flavipes* (Isoptera: Rhinotermitidae). *Sociobiology* 55: 217-227.
58. *Phillips, A. K., **A. G. Appel**, and S. R. Sims. 2010. Topical toxicity of essential oils to the German cockroach (Dictyoptera: Blattellidae). *J. Econ. Entomol.* 103: 448-459.
59. *Dingha, B. N., **A. G. Appel** and J. T. Vogt. 2009. Effects of temperature on the metabolic rates of insecticide resistant and susceptible German cockroaches, *Blattella germanica* (L.) (Dictyoptera: Blattellidae). *Midsouth Entomologist*. 2: 17-27.
60. **Appel, A. G.**, M. J. Eva and *E. T. Snoddy. 2009. Distribution of the Asian cockroach, *Blattella asahinai* (Dictyoptera: Blattellidae), in Dothan, Alabama. *Ala. Acad. Sci.* 80: 1-9.
61. Smith, L. M. II and **A. G. Appel**. 2008. Comparison of several traps for catching German cockroaches (Dictyoptera: Blattellidae) under laboratory conditions. *J. Econ. Entomol.* 101: 151-158.
62. *Snoddy, E. T. and **A. G. Appel**. 2008. Distribution of *Blattella asahinai* (Dictyoptera: Blattellidae) in southern Alabama and Georgia. *Ann. Entomol. Soc. Amer.* 101: 397-401.
63. Sims, S. R., and **A. G. Appel**. 2007. Linear alcohol ethoxylates: insecticidal and synergistic effects on German cockroaches (Blattodea: Blattellidae) and other insects. *J. Econ. Entomol.* 100: 871-879.
64. Thompson, J. M., **A. G. Appel**, J. L. Sibley, G. J. Keever, and W. G. Foshee. 2006. Comparative water relations of three sympatric terrestrial slugs (Stylommatophora: Agriolimacidae, Limacidae, and Philomycidae). *J. Ala. Acad. Sci.* 77: 181-192.
65. *Shelton, T. G., X. Ping Hu, **A. G. Appel**, and T. L. Wagner. 2006. Flight speed of tethered *Reticulitermes flavipes* (Kollar) (Isoptera: Rhinotermitidae) alates. *J. Insect Behavior*. 19: 115-128.
66. Ward, C. K., **A. G. Appel**, and M. T. Mendonça. 2006. Metabolic measures of male southern toads (*Bufo terrestris*) exposed to coal combustion waste. *Comp. Biochem Physiol. A.* 143: 353-360.
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c. Proceedings (9)

d. Published Abstracts (29)

e. Non-refereed Journals and Extension Publications (70)

2. Papers or lectures:

a. Papers presented at professional meetings (142)

b. Invited Seminars and Presentations (25)

c. Extension-related Presentations: Lectures (58)

d. Extension-related Presentations: Mass media (35)

3. Other research/creative contributions:

a. Seminars (20)

b. Published photographs (2)

4. Grants and contracts:

a. Gifts, Grants and Contracts

TOTAL INDUSTRY-DERIVED FUNDS: \$1,506,692

TOTAL EXTRAMURAL GRANTS AND PROJECTS: \$1,151,372

TOTAL EXTRAMURAL FUNDS: \$2,658,064

b. University: \$430,700

c. Experiment Station Funds \$525,0005. Current Primary Research Projects

a. Development of integrated pest management systems for control of domestic and peridomestic cockroaches. This research combines new information on cockroach population dynamics, harborage selection, inter- and intraspecific interactions, targeted insecticide applications, and trap-catch dynamics into systems that control cockroaches better, faster, longer, and less expensively than standard methods while reducing insecticide use.

b. Comparative water relations, temperature sensitivity, and respiratory strategies of cockroaches and other urban arthropod pests.

c. Alabama Agricultural Experiment Station Hatch Projects 661 (1985-90), ALA-08-002 (1990-95), ALA-08-019 (1995-2000, extension to 2001), ALA-08-042 (2001-2006), ALA-08-058 (2008-2012), ALA-08-055 (2007-2010), ALA-15-1-18039 (2018-2023).

C. Extension

Although I have no formal extension appointment, I regularly participate in extension work. This participation includes answering homeowner and county agent telephone and email inquiries, identification of household and structural arthropod pests, conducting extension demonstration projects, making presentations to homeowner and industry groups, and developing and making control recommendations. During my appointment at Auburn University, there were several years when no other trained urban entomologist was on the faculty. I assisted existing extension faculty in preparing recommendations and extension literature.

D. Service1. University Service:University:

- Member, Central Unit Allocations Committee, representing AAES (Continuing)
- Member, University Safety Committee, representing AAES (Continuing)
- Member, the Tenure and Promotion Committee, representing the College of Agriculture (2016-2019)
- Member, University Faculty Dismissal Hearing Committee (2005-2006)
- Member, Alumni Professor Selection Committee (2003-06)
- Member, University Radiological Safety Officer Search Committee (2002)
- Member, College of Agriculture Administrative Assessment Team (2001)
- Member, University Radiological Safety Committee (2000-03)
- Member University Instrumentation Committee (1988-91)
- Member, Alabama IR-4 Committee

Departmental:

- Chair, Department of Entomology and Plant Pathology, Insect-Vector Borne Disease (2017-2019).
- Member, Department of Entomology and Plant Pathology, faculty-mentoring committee.
- Member, Department of Biological Sciences, Assistant Research Professor search committee (2018).
- Chair, Department of Entomology and Plant Pathology, Medical Entomology search committee (2016-2017)
- Chair, Department of Entomology and Plant Pathology, Departmental CSREES review committee (2001-2002)
- Member, Department of Entomology and Plant Pathology Executive Committee (2000-02)
- Chair, Department of Entomology and Plant Pathology, Resource Committee (1999-2001)
- Chair, search committee Department of Entomology and Plant Pathology, Urban Entomology Extension/Research position (1999-2000)
- Chair, Research sub-committee of Department of Entomology and Plant Pathology Merger Committee (1999)
- Member, Department of Entomology and Plant Pathology Merger Coordinating Committee (1999)

- Chair, Department of Entomology, Awards Committee (1997-99)
- Chair, search committee Department of Entomology, Toxicologist/ Physiologist position (1996-97)
- Member, Department of Entomology, Curriculum and Academic Quality Committee (1995-)
- Member, Department of Entomology, Computer Facilities/Instrumentation Committee (1996-)
- Member, Department of Entomology, Administrative Advisory and Transition Committee (1995-)
- Member, Awards and Scholarship Committee, Department of Entomology (1995)
- Member, search committee Department of Entomology, Toxicologist/ Physiologist position (1995)
- Member, search committee Department of Entomology, Department Head position (1994)
- Member, search committee Department of Entomology, Urban Extension Entomologist position (1994)
- Chair, Department Curriculum Committee (1990-1991)
- Member, search committee Department of Entomology, Urban/Apiculture Extension Entomologist position (1989)
- Member, Pest, and Pesticide Conference Planning Committee (1988)
- Co-advisor F. S. Arant Entomology Club at Auburn University (1986; 2001-2002)
- Chair, Departmental Seminar Committee (1986-1988)
- Member, Departmental Curriculum Committee
- Member, Departmental Recruitment Committee

College:

- Member, College of Agriculture, Teaching and Demonstration Gardens Committee (2016)
- Member, College of Agriculture, Tenure and Promotion Committee, representing the Department of Entomology and Plant Pathology (2016)
- Member, College of Agriculture, Dean and Director of the Alabama Agricultural Experiment Station, Search Committee (1998, 2003-2004).
- Member, College of Agriculture, Interim Dean and Director of the Alabama Agricultural Experiment Station, Search Committee (2001).
- Member, College of Agriculture, Teaching Improvement Committee (1995-2000)
- Member, AAES Strategic Plan Advisory Committee (1994-)
- Member, Dean's Award for Teaching Excellence selection committee, College of Agriculture, Auburn University (1993-1996). Vice Chair 1995
- Chair, Urban/Rural Problems Development Committee for Alabama Agricultural Experiment Station Strategic Plan (1992)
- Member, Dean's Advisory Committee, College of Agriculture, Department of Entomology representative (1989-1993)
- Member, Auburn University College of Agriculture AG Alumni Committee

2. Professional Service:

National:

- Member of U.S. E.P.A. FIFRA Scientific Advisory Panel, FIFRA SAP review methods for efficacy testing of products used for flea and tick control on companion animals (2019).
- Member of U.S. E.P.A. FIFRA Scientific Advisory Panel, FIFRA SAP review methods for efficacy testing of pesticides used for premise treatments for invertebrate pests and treatment for fire ants (2018).

Organizations:

- Member of the Program Committee for 2019 Southeastern Branch – Entomological Society of America meeting, Mobile, AL March 2019 (2018-2019).
- Subject Editor for Household and Structural Insects, Journal of Economic Entomology, Entomological Society of America (2001-2006 and 2012-present).
- Member, Entomological Society of America, Jeffery LaFage Graduate Student Research Award evaluation committee (2004-06).
- Member, Peer Review Committee, State of Texas Imported Fire Ant Project (2002).

- Chair, National Conference on Urban Entomology, Awards Committee, for 2000 meeting.
- Chair, Entomological Society of America, National Urban Entomology Award Committee, 1998, 1999.
- Chair, National Conference on Urban Entomology, Organizing Committee, for 1998 meeting.
- Chair, student awards committee, Southeastern Branch, Entomological Society of America, 1996.
- Member at large, Auburn University Chapter of Sigma Xi (1995-1997)
- Member, student awards committee of the Southeastern Branch, Entomological Society of America, 1993-1997, and 1986-1990
- Member, Board of Reviewing Editors and Associate Editor for the Journal of Economic Entomology, Household and Structural Insects Section, Entomological Society of America, 1992-1995
- Member, Richardson Research Grant Committee, Entomological Society of America, 1992-1993
- Associate Editor of the Alabama Academy of Sciences Newsletter, 1992-1996
- Secretary, Auburn University chapter of Sigma Xi (1991-1992)
- Member, National Conference on Urban Entomology, Organizing Committee, 1991-1996
- Moderator, student paper competition, Southeastern Branch, Entomological Society of America, 1989
- Judge, student poster presentations, National Meeting Entomological Society of America, 1988
- Consultant to numerous companies on development of consumer and professional use of insecticides
- Consultant to the state of Alabama on insecticide registration
- Expert witness for the state of Alabama and numerous individuals and companies

Manuscripts Reviewed:

- a. Departmental: 39
- b. Professional: >500: Entomological Society of America journals: Annals, Environmental Entomology, Journal of Economic Entomology; Comparative Biochemistry and Physiology, Journal of Insect Physiology, Journal of Experimental Biology, Physiological Entomology, Physiological and Biochemical Zoology, PNAS, Science,

Books Reviewed:

- a. Professional: 5

Grant Proposals Reviewed:

- Twenty USDA grants, 1 BARD grant, 60 Hatch proposals, and 6 NSF grants.
- Consultant and competitive grant reviewer for the National Research Council (NRC), England, while on sabbatical leave in 1993.

Society/Regional Affiliations:

- Alabama Academy of Sciences
- American Association for the Advancement of Science
- American Society of Zoologists
- Animal Behavior Society
- Entomological Society of America
- Entomological Society of Washington
- Royal Entomological Society
- Sigma Xi

3. Community Service:

- Committee Chair and Treasurer, Boy Scout Troop 7, Auburn, Alabama
- Member, Civitan International Service organization
- Judge at local and statewide science fairs
- Presentations to homeowner, school, and service organizations (see above)
- A founding member and founding treasurer, Alabama PALs (People Against a Littered State), statewide organization.