Nomination for ICAC Cotton Researcher of the Year

I. Name: Freddie Marshall Bourland
Address: University of Arkansas - Northeast Research and Extension Center
P.O. Box 48, Keiser, AR 72351 U.S.A.
Position: Professor and Center Director
E-mail: bourland@uark.edu Phone: 870-526-2199

II. Field of Research: Cotton Breeding/Genetics

III. Awards/recognition:
University of Arkansas - Arkansas Cotton Achievement Award, 1999
University of Arkansas - John W. White Team Research Award, 1999
National Cotton Council - Joint Cotton Breeding Committee Genetics Award, 2001

IV. Publications

Books published:

COTMAN™ Management System. 2008. Compiled and edited by D.M. Oosterhuis and **F.M. Bourland**. Published by the University of Arkansas, Ark. Agri. Exp. Sta., Fayetteville, AR, and Cotton Incorporated, Raleigh, NC.

Chapters published - As main author/editor:

Bourland, F.M., F.L. Baldwin, M.J. Cochran, D.R. Johnson, C.D. Klein, D.M. Oosterhuis, and N.P. Tugwell. 1997. Pest Management. p. 41-48. *In* Alternatives, Accomplishments of the University of Arkansas Alternative Pest Control Center 1989-1995. Ark. Agric. Exp. Station Special Report 180.

Bourland, F.M., N.P. Tugwell, D.M. Oosterhuis, and M.J. Cochran. 2008. Chapter 2. Initial development of the COTMAN program. pp. 15-20. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., N.P. Tugwell, D.M. Oosterhuis, M.J. Cochran, and D.M. Danforth. 1998. Chapter 3. SQUAREMAN decision rules. pp. 13-16. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., D.M. Oosterhuis, and W.C. Robertson. 1998. Chapter 5. Plant height and vigor indices pp. 37-40. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., D.M. Oosterhuis, N.P. Tugwell, and M.J. Cochran. 1998. Chapter 6. Stepwise progression through BOLLMAN with instructions for non-computer users. pp. 41-52. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., D.M. Oosterhuis, N.P. Tugwell, M.J. Cochran, and D.M. Danforth. 1998. Chapter 7. Interpretation of crop growth curves generated by COTMAN. pp. 53-60. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., D.M. Oosterhuis, N.P. Tugwell, and M.J. Cochran. 2008. Chapter 7. Stepwise progression through BOLLMAN with instructions for non-computer users. pp. 45-54. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., D.M. Oosterhuis, N.P. Tugwell, M.J. Cochran and D.M. Danforth. 2008. Chapter 9. Interpretation of crop growth patterns generated by COTMAN. pp. 63-70. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Bourland, F.M., N.P. Tugwell, T.A. Kerby, N.R. Benson, and D.M. Danforth. 2008. Chapter 13. Recurring questions about COTMAN. pp. 85-90. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

As co-author/co-editor:

Halloin, J.M. and **F.M. Bourland**. 1981. Deterioration of planting seed. IN Compendium of Cotton Diseases, pp. 11-13. Published by Amer. Phytopathological Soc., G.M. Watkins, ed.

DeVay, J.E., K.M. El-Zik, **F.M. Bourland**, R.H. Garber, A.M. Kappleman, S.D. Lyda, E.B. Minton, P.A. Roberts, and T.P. Wallace. 1989. Strategies and Tactics for Managing Plant Pathogens and Nematodes. p. 225-266. In R.E. Frisbie, K.M. El-Zik, and L.T. Wilson (eds.) Integrated Pest Management Systems and Cotton Production. John Wiley & Sons, Inc., New York, NY.

Cochran, M.J., D.M. Danforth, **F.M. Bourland**, N.P. Tugwell, and D.M. Oosterhuis. 1998. Chapter 1. Overview of the COTMAN expert system of cotton plant management. pp. 1-6. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Tugwell, N.P., G. Lorenz, K.W. Vodraska, T.G. Teague, **F.M. Bourland**, and D.M. Danforth. 1998. Chapter 2. COTMAN sampling and data collection. pp. 7-12. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Oosterhuis, D.M., **F.M. Bourland**, N.P. Tugwell, and M.J. Cochran. 1998. Chapter 9. Terminology and concepts related to the COTMAN crop monitoring system. pp. 63-72. *In* M.J. Cochran et al., (eds) COTMAN Expert Sytem, Version 5.0. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Brubaker, C.L., **F.M. Bourland**, and J.F. Wendel. 1999. Chapter 1.1. The origin and domestication of cotton. p 1-31. *In* C.W. Smith (ed.) Cotton: Origin, History, Technology, and Production. John Wiley and Sons, New York, NY.

Oosterhuis, D.M., and **F.M. Bourland**. 2001. Development of the cotton plant. pp. 3-7. *In* T. L. Kirkpatrick and C. S. Rothrock (eds.) Compendium of cotton diseases. 2nd ed. Am Phytopathol. Soc., St. Paul, MN.

May, O.L., **F.M. Bourland**, and R.L. Nichols. 2003. Challenges in testing transgenic and non-trangenic cotton cultivars (accepted for publication). *In* Evaluation of Transgenic Cultivars, American Society of Agronomy, Madison, WI.

Oosterhuis, D.M., **F.M. Bourland**, N.P. Tugwell, M.J. Cochran, and D.M. Danforth. 2008. Chapter 1. Overview of the COTMAN expert system of cotton plant management. pp. 11-14. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Leser, J.F., D.M. Danforth, and **F.M. Bourland**. 2008. Chapter 6. SQUAREMAN decision rules. pp. 37-44. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Oosterhuis, D.M., N.P. Tugwell, D.D. Fromme, and **F.M. Bourland**. 2008. Chapter 10. Using COTMAN to manage defoliation and harvest efficiency. pp. 71-74. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN™ Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Robertson, W.C., D.M. Oosterhuis, N.R. Benson, F.E. Groves, and **F.M. Bourland**. 2008. Chapter 11. Utilization of COTMAN to enhance yield and revenue of cotton. pp. 75-80. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN^{TM} Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Oosterhuis, D.M., **F.M. Bourland**, M.J. Cochran, and D.M. Danforth. 2008. Chapter 14. Terminology and concepts related to the COTMAN crop management system. pp. 91-98. *In* D.M. Oosterhuis and F.M. Bourland (eds) COTMAN^{TM} Crop Management System. Publ. Univ. of Ark., Ark. Agri. Exp. Sta., Fayetteville, AR.

Kerby, T.A., **F.M. Bourland**, and K.D. Hake. 2010. Physiological rationale in plant monitoring and mapping. pp. 304-317. *In* Physiology of Cotton. Stewart, J.M.; Oosterhuis, D.M.; Heitholt, J.J.; Mauney, J.R. (Eds.) ISBN: 978-90-481-3194-5. Springer, The Netherlands.

Peer –reviewed research papers published (* Graduate student directed by Bourland):

National:

Bourland, F.M. and A.A.L. Ibrahim*. 1982. Effects of accelerated aging treatments on six cotton cultivars. Crop Sci. 22:637-640.

Roy, K.W. and **F.M. Bourland**. 1982. Epidemiological and mycofloral relationships in cotton seedling disease in Mississippi. Phytopathology 72:868-872.

Bourland, F.M. and J.F. Mahill. 1985. Effects of exotic cytoplasms on seed quality of cotton. Crop Sci. 25:348-350.

Bourland, F.M. 1987. Registration of Miscot 7813 and Miscot 7841 germplasm lines of cotton. Crop Sci. 27:367.

Bourland, F.M. 1988. Registration of Miscot 7913-51, Miscot 7913-83, and Miscot 7913-84 germplasm lines of cotton. Crop Sci. 28:200-201.

Bourland, F.M. and R.R. Bridge. 1988. Registration of Miscot T8-27 cotton germplasm. Crop Sci. 28:1035.

Bourland, F.M. and B.A. Waddle. 1988. Cotton Research Overview-Breeding. Arkansas Farm Research. p.7, vol. 37, no. 4.

Bourland, F.M. and B.W. White*. 1989. Registration of Miscot 7918 cotton germplasm. Crop Sci. 29: 242.

Bourland, F.M. and B.W. White*. 1989. Registration of Miscot 7803-51 and Miscot 7803-52 germplasm lines of cotton. Crop Sci. 29: 242-243.

Bourland, F.M., S.M. Furbeck*, and B.W. White*. 1990. Registration of Miscot 7853 cotton germplasm. Crop Sci. 30: 756.

Bourland, F.M. and C.E. Watson, Jr. 1990. COTMAP, a technique evaluating structure and yield of cotton. Crop Sci. 30: 224-226.

Bourland, F.M. and C.E. Caviness. 1990. Genetic and biological pest control in cotton and soybean. Ark. Farm Research p. 7, vol. 39, no. 3.

McConnell, J.S., **F.M. Bourland**, B.S. Frizzell, and W.H. Baker. 1991. Enhanced cotton fiber strength through the use of blended cultivars. Ark. Farm Research p. 3, vol. 40, no. 5.

Bourland, F.M. and B.W. White*. 1992. Registration of Miscot 7801 and Miscot 7824 germplasm lines of cotton. Crop Sci. 32:834.

Bourland, F.M., D.M. Oosterhuis, and N.P. Tugwell. 1992. Concept for monitoring the growth and development of cotton plants using main-stem node counts. J. Prod. Agric. 5:532-538.

Bourland, F.M., M.J. Cochran, D.M. Oosterhuis, and N.P. Tugwell. 1992. Evaluation and integration of alternative pest control tactics in cotton. Ark. Farm Research 41(4):10-11.

Oosterhuis, D.M., **F.M. Bourland**, and N.P. Tugwell. 1992. Basis for the nodes above white flower cotton monitoring system. Ark. Farm Research 41(5):3-5.

Bourland, F.M., C.E. Ortiz*, and B.W. White*. 1993. Registration of Miscot 8001, Miscot 8004, and Miscot 8006 germplasm lines of cotton. Crop Sci. 33:1106.

Maredia K.M., N.P. Tugwell, B.A. Waddle, and **F.M. Bourland**. 1994. A simple and rapid technique for screening cotton germplasm for resistance to tarnished plant bug, Lygus lineolaris (Palisot de Beauvois). Southwest. Entomol. 19:63-70.

McConnell, J.S., R.E. Glover, E.D. Vories, W.H. Baker, B.S. Frizzell, and **F.M. Bourland**. 1995. Nitrogen fertilization and plant development of cotton as determined by nodes above white flower. J. of Plant Nutrition 18:1027-1036.

Bourland, F.M. 1996. Registration of 'H1330' cotton. Crop Sci. 36:813.

Bourland, F.M., R.E. McGowen, Jr.*, and N.P. Tugwell, Jr. 1997. Registration of Arkot 8110 cotton germplasm. Crop Science 37:1395-1396.

Bourland, F.M., R.E. McGowen, Jr.*, and J.T. Johnson*. 1997. Registration of Arkot 8303 germplasm line of cotton. Crop Science 37:1396.

Bourland, F.M., R.E. McGowen, Jr.*, and J.T. Johnson*. 1997. Registration of Arkot 8102, Arkot 8506, and Arkot 8514 germplasm lines of cotton. Crop Science 37:1397.

McConnell, J.S., **F.M. Bourland**, W.H. Baker, and B.S. Frizzell. 1997. Yield, earliness and fiber strength of blends of cotton (*Gossypium hirsutum* L.) cultivars. Ark. Agri. Exp. Stn. Bul. 953.

Bourland, F.M., R.E. McGowen, Jr.*, and C.W. Smith. 1998. Registration of Arkot A129 and Arkot A132, two germplasm lines of cotton with high fiber strength. Crop Sci. 38:567-568.

Bourland, F.M. and N.P. Tugwell. 1999. Evaluation of injury of tarnished plant bugs, (*Lygus lineolaris* Palisot De Beauvois) to blended cotton genotypes. J. Cotton Sci. 3:171-176.

Bourland, F.M., N.R. Benson*, E.D. Vories, N.P. Tugwell, and D.M. Danforth. 2001. Measuring maturity of cotton using nodes above white flower. J. Cotton Sci. 5:1-8.

Bourland, F.M. and C.W. Smith. 2001. Registration of Arkot A306 and Arkot A314 germplasm lines of cotton. Crop Sci. 41:2008-2009.

Bourland, F.M. and N.R. Benson*. 2002. Registration of Arkot 8606, an early-maturing cotton germplasm line. Crop Sci. 42:1382-1383.

Bourland, F.M. and N.R. Benson*. 2002. Registration of Arkot 8710 and Arkot 8717 cotton germplasm lines. Crop Sci. 42:1383.

Bourland, F.M. and N.R. Benson*. 2002. Registration of Arkot 8727, a high glanding cotton germplasm line. Crop Sci. 42:1384.

Bourland, F.M. and N.R. Benson*. 2002. Registration of Arkot 8918 and Arkot 9103 cotton germplasm lines. Crop Sci. 42:1384-1385.

Bourland, F.M., J.M. Hornbeck*, A.B. McFall*, and S.D. Calhoun. 2003. A rating system for leaf pubescence of cotton [Online]. J. Cotton Sci. 7:8-15. Available at http://www.cotton.org/journal/2003-07/2/8.cfm

Nichols, R., L. May, and **F. Bourland**. 2003. Preamble, Special Symposium - 2001 CSSA Meeting (Charlotte). Crop Sci. 43:1582-1583.

May, O.L., **F.M. Bourland**, and R.L. Nichols. 2003. Challenges in testing transgenic and nontransgenic cotton cultivars. Crop Sci. 43:1594-1601.

Bryant, K.J., R.L. Nichols, C.T. Allen, N.R. Benson*, **F.M. Bourland**, L.D. Earnest, M.S. Kharboutli, K.L. Smith, and E.P. Webster. 2003. Transgenic cotton cultivars: An economic comparison in Arkansas. J. Cotton Sci. 7:194-204.

Bowman, D.T., **F.M. Bourland**, G.O. Myers, T.P. Wallace and D. Caldwell. 2004. Visual selection for yield in cotton breeding programs. J. Cotton Sci. 8:62-68.

Bourland, F.M., J. T. Johnson* and D.C. Jones. 2005. Registration of Arkot 8712 germplasm line of cotton. Crop Sci. 45:1173-1174.

Bourland, F.M. and D.C. Jones. 2005. Registration of Arkot 9111 germplasm line of cotton. Crop Sci. 45:2127-2128.

Bourland, F.M. and D.C. Jones. 2005. Registration of Arkot 9101 and Arkot 9108 germplasm lines of cotton. Crop Sci. 45:2128-2129.

Bourland, F.M. and D.C. Jones. 2006. Registration of Arkot 9203-03 and Arkot 9203-17 germplasm lines of cotton. Crop Sci. 46:1408-1409.

Bourland, F.M., J.M. Stewart, and D.C. Jones. 2006. Registration of three Arkot S23 germplasm lines of cotton. Crop Sci. 45:1409.

Bourland, F.M. and D.C. Jones. 2006. Registration of Arkot 9202 and Arkot 9208 germplasm lines of cotton. Crop Sci. 46:1412.

Bourland, F.M. and D.C. Jones. 2006. Registration of Arkot 9406ne, Arkot 9605ne, and Arkot 9631ne, three nectariless germplasm lines of cotton. Crop Sci. 46:1833-1834.

Bourland, F.M. and D.C. Jones. 2006. Registration of Arkot 9315 and Arkot 9409 germplasm lines of cotton. Crop Sci. 46:2333-2334.

Bourland, F.M. and D.C. Jones. 2007 Registration of Arkot 9506 and Arkot 9513 germplasm lines of cotton. J. Plant Registrations 1:54-55.

Bourland, F.M. and D.C. Jones. 2007 Registration of Arkot 9304a, Arkot 9304b, Arkot 9308 and Arkot 9314 germplasm lines of cotton. J. Plant Registrations 1:56-57

Bourland, F.M. and D.C. Jones. 2007. Registration of Arkot RM24 cotton germplasm line. J. Plant Registrations 1: 149-152.

Bourland, F.M. and J.M. Hornbeck*. 2007. Variation in marginal bract trichomes on Upland cotton. J. Cotton Sci. 11:242-251. Available at http://www.cotton.org/jounal/2007/11/4/242.cfm

Hornbeck, J.M.*, and **F.M. Bourland**. 2007. Visual ratings and relationships of trichomes on bracts, leaves, and stems of Upland cotton. J. Cotton Sci. 11:252-258. Available at http://www.cotton.org/jounal/2007/11/4/252.cfm

Bourland, F.M. and D.C. Jones. 2008. Registration of Arkot 9608ne germplasm line of cotton. J. Plant Registrations 2:125-128.

Bourland, F.M. and D.C. Jones. 2008. Registration of Arkot JJ46, Arkot 9610, and Arkot 9620 germplasm lines of cotton. J. Plant Registrations 2:235-238.

Bryant, K.J., J.M. Reaves, R.L. Nichols, J.K. Green, C.H. Tingle, G.E. Studebaker, **F.M. Bourland**, C.D. Capps, Jr., and F.E. Groves. 2008. Valuing transgenic cotton technologies using a risk/return framework. J. Agric. and Applied Economics 40:767-775.

Bourland, F.M. and D.C. Jones. 2009. Registration of Arkot 9623 and Arkot 9625 germplasm lines of cotton. J. Plant Registrations 3:69-72.

Bourland, F.M. and D.C. Jones. 2009. Registration of Arkot 9704 and Arkot 9706 germplasm lines of cotton. J. Plant Registrations 3:289-292.

Bourland, F.M. and D.C. Jones. 2009. Registration of Arkot 9721 germplasm line of cotton. J. Plant Registrations 3:293-296.

Cole, C.B., D.T. Bowman, **F.M. Bourland**, W.D. Caldwell, B.T. Campbell, D.E. Fraser, and D.B. Weaver. 2009. Impact of heterozygosity and heterogeneity on cotton lint yield stability. Crop Sci. 49:1577-1585.

Bourland, F.M., R. Hogan, D.C. Jones, and E. Barnes. 2010. Development and utility of Q-score for characterizing cotton fiber quality. J. Cotton Science (in press).

Bourland, F.M., and D.C. Jones. 2010. Registratin of Arkot 9811 and Arkot 9815 germplasm lines of cotton. J. Plant Registrations (in press).

Groves, F.E.*, and **F.M. Bourland.** 2010. Estimating seed surface area of cottonseed. J. Cotton Science (in press).

<u>International (* Graduate student directed by Bourland):</u>

Bourland, F.M. and L.S. Bird. 1983. Genetic evaluation of selected seed and seed coat traits in cotton. J. of Heredity 74:118-120.

Bourland, F.M. and L.S. Bird. 1985. A diallel analysis of seedling growth in cotton. Field Crops Res. 10:197-203.
Bailey, B.A.* and **F.M. Bourland**. 1986. The influence of seed quality on response of cotton seedlings to the preplant herbicide trifluralin. Field Crops Res. 13:375-382.
Bourland, F.M., G. Kaiser*, and E.R. Cabrera. 1988. Rapid deterioration of cotton, *Gossypium hirsutum* L., seed using hot water. Seed Sci. and Technol. 16:673-683.
Furbeck, S.M.*, **F.M. Bourland**, and E.R. Cabrera. 1989. Comparison of the hot water and accelerated aging techniques for deterioration of cottonseed. Seed Sci. and Technol. 17:255-261.
Furbeck, S.M.*, **F.M. Bourland**, and C.E. Watson, Jr. 1993. Inheritance of resistance to seed deterioration in cotton. Euphytica 69:203-209.
Furbeck, S.M.*, **F.M. Bourland**, and C.E. Watson, Jr. 1993. Relationships of seed and germination measurements with resistance to seed weathering in cotton. Seed Sci. & Technol. 21:505-512.
Ortiz, C.E.* and **F.M. Bourland**. 1999. Comparative early growth of cotton seedlings expressing a visible true leaf at emergence and normal phenotype seedlings. J. Agric. Univ. P.R. 83:19-31.
Teague, T.G., J. Lund, J.T. Sangepogu, **F.M. Bourland**. 2008. Techniques for evaluating feeding preferences of *Lygus lineolaris* in Midsouth cotton. In: P. B. Goodell, and P.C. Ellsworth, eds. Second International *Lygus* Symposium, Asilomar. 27 pp. Journal of Insect Science.

Non-reviewed Publications:

Total = 178 (88 with Bourland or his graduate student as senior author, 90 co-authored)
Abstracts = 87 (60 with Bourland or his graduate student as senior author, 27 co-authored)

V. Conferences Attended:

Local and state: Have attended and made presentations (mainly associated with cotton varieties, COTMAN, and breeding program) to more than 50 statewide meetings, to more than 90 county production meetings and to more than 40 other groups.

National – Beltwide Cotton Production Research Conferences:

Presentations by Bourland and his graduate students* include:

1974. Adversity-multi-disease resistant okra leaf and frego bract cottons.
1975. The influence of pathogen occurence and degree of root damage on the growth of cotton seedlings.
1977. Advances in developing multi-adversity resistant normal leaf, normal bract cultivars of cotton.
1977. Additional progress in developing okra leaf, frego bract, and glabrous multi-adversity resistant cottons.
1978. Maturity strata x cultivar interaction for fiber micronaire values of multi-adversity resistant cottons.
1978. The inheritance of seed weight, volume and density in TAM-MAR cultivars.
1980. Effects of delinting and drying methods on cotton seed quality.
1980. Differential earliness factors of short-season cottons. *
1981. Differential tolerance of cotton cultivars to trifluralin.
1982. Side by side branching of selected cotton genotypes in Mississippi.
1983. Yield of cotton cultivars in relation to heat units and rainfall at Mississippi State.
1984. Techniques for selecting and evaluating tolerance to trifluralin in cotton.
1984. Heat unit accumulation and phenological development of four cotton cultivars in Mississippi.*
1985. Effects of selection for tolerance to trifluralin in cotton.
1985. Variation in plant height and monopodial branches among selected cotton cultivars.

1985. Deterioration of cottonseed with hot water.
1986. Variation in early fruiting and boll retention in cotton.
1986. Effects of trifluralin and pendimethalin on cotton emergence and seedling characteristics.*
1986. Effects of chlordimeform on early boll retention and yield of cotton. *
1987. Variation among cotton genotypes for water imbibition and tolerance to hot water seed treatment.
1988. Effects of seed quality on cotton plant development and yield in uniform stands.
1988. Genetic differences in cotton seedling development in the presence and absence of trifluralin.*
1990. Genetic evaluation of resistance to seed deterioration in cotton.
1990. Monitoring seasonal development of cotton plants. *(invited)*
1991. Maturity of cotton cultivars in Arkansas as determined by nodes above white bloom.
1992. Reading the plant for efficient management. *(invited)*
1992. Characterization and improvement of seed and seedling vigor in cotton. *(invited)*
1993. Variation in plant structure and fruiting behavior of cotton cultivars grown in Arkansas.*
1993. Breeding behavior of tufted seed character in cotton, *Gossypium hirsutum* L. *
1995. Relationships and inheritance of selected seedling vigor parameters in cotton. *
1995. Variation in growth patterns among cotton cultivars using nodes-above-white-flower.*
1995. Influence of capsule and leaf size on boll parameters in contrasting cotton genotypes. *
1995. Relationship of stand and seedling disease resistance among interrelated cotton genotypes. *
1995. Evaluation of resistance to tarnished plant bug in cotton.*
1996. Inheritance of resistance to tarnished plant bug in cotton based on injury to anthers. *
1996. Variation in leaf and bract pubescence on cotton plants of contrasting cultivars.
1996. Basis and description of a leaf pubescence system for cotton.
1996. Selection for improved cotton planting seed quality.
1996. Identification of the last effective flower population using nodes above white flower. *
1996. Growth pattern evaluation of contrasting cotton cultivars using COTMAN procedures. *
1997. Interpretation of crop growth curves generated by COTMAN.
1997. Non-computer version of the BOLLMAN crop monitoring program.
1997. Critical values for identifying the last effective boll population.
1997. Relationships between maturity and fiber properties for cotton cultivars in Arkansas. *
1997. Variation in tolerance to Verticillium wilt among cotton cultivars in Arkansas. *
1997. Variation in number of trichomes on bracts of cotton plants. *
1998. Establishment of SQUAREMAN decision rules for managing early-season cotton.
1998. Association of cotton stands with germination in stress and non-stress tests.
1998. Illustration of crop growth patterns generated by COTMAN.
2000. Inherent biases in the Arkansas cotton variety testing program.
2001. Variation in number of trichomes on cotton stems, leaves and bracts. *
2002. Variation in marginal bract trichomes among cotton cultivars. *
2003. Stability of basic yield components of cotton over years and locations. *
2003. Transgenic vs. conventional varieties in Arkansas Cotton Variety Tests, 1996-2002. *
2003. Measurement and relationships of leaf, stem and bract trichomes on cotton. *
2003. Variation in marginal bract trichomes among contrasting cotton cultivars. *
2004. Overview of the University of Arkansas Cotton Breeding Program.
2005. Cotton varieties planted in Arkansas, 1995-2004.
2005. Yield and fiber quality of transgenic vs. conventional cotton varieties in the Arkansas cotton variety tests, 1995-2004.
2005. Stability of yield and fiber quality in the north Delta: II. Comparison of varieties.
2005. Variation in marginal bract trichomes of cotton cultivars. *
2006. Cotton germplasm lines released in 2004 and 2005.

2006. Additional cotton germplasm lines released in 2005.
2007. Cotton germplasm lines released by the University of Arkansas in 2006.
2007. Development of COTVAR, a computer program for comparing performance of cotton varieties in state variety tests.
2008. New tools for choosing cotton varieties. *(invited)*
2008. Relationships of yield component variables to yield and fiber parameters.*
2008. Cotton germplasm lines released by the University of Arkansas in 2007.
2009. Cotton germplasm lines released by the University of Arkansas in 2008.
2009. Relationship of different seed measurements for estimating seed surface area and certain yield components. *
2010. Use of Q-score in a cotton breeding and variety testing program.
More than 60 additional presentations at Beltwide conferences have been co-authored by Bourland.

National – American Soc. of Agronomy: Presentations by Bourland and his graduate students*:
1980. Differential effects of seed deterioration on cotton cultivars
1984. Development of resistance to Heliothis virescens (F.) in cotton using indirect selection techniques.
1984. Relationship of monopodia branches and plant height to earliness and yield of cotton.
1986. Differential response of nine cotton, *Gossypium hirsutum* L., cultivars to trifluralin and pendimethalin. *
1986. Rapid deterioration of cottonseed using hot water. *
1987. A modified whole-plant method for mapping fruit on cotton plants.
1987. Comparison of the hot water and accelerated aging techniques for deterioration of cottonseed. *
1989. Diallel analysis of selected seed characteristics in Upland cotton. *
1990. Breeding for enhanced secondary root development in cotton.
1990. Variation in first true leaf development among cotton genotypes.
1991. Inheritance of first true leaf development in cotton seedlings. *
1991. Effects of management factors on post-flowering nodal development in cotton.
1993. Crop- and weather-oriented models for timing cotton defoliation.
1995. Inheritance of resistance to tarnished plant bug in cotton. *
1995. Analysis of main-stem nodal development of cotton cultivars having contrasting maturity.*
1995. Update of the COTMAN expert system for monitoring and managing cotton.
2001. Challenges in cotton cultivar testing. *(invited)*
2007. COTVAR, a computer program for comparing performance of cotton varieties in state variety tests.

National meetings - Other: Presentations made by Bourland and his graduate students* include:
1996. Agronomic management of Bt cotton. Cotton Incorporated Crop Management Seminar. *(invited)*
1996. Management for physiological and economic efficiency. Cotton Incorporated Crop Management Seminar *(invited)*
2002. Breeding cleaner cottons. Cotton Incorporated Engineered Fiber Selection Conference. *(invited)*
2002. COTMAN overview. Cotton Incorporated Crop Management Seminar. *(invited)*
2002. Breeding cotton for fewer bract trichomes. Cotton Incorporated's Cotton Genetics Group *(invited)*
2002. Evaluation of cotton yield components. Cotton Incorporated's Cotton Genetics Group Meeting.*

2005. Cotton varieties with high yield and excellent fiber quality? Cotton Incorporated Engineered Fiber Selection Conference. *(invited)*
2008. Public cotton breeding programs. Technical Committee on Cotton Quality *(invited)*
2008. Fiber quality improvement: Q-score and bract trichomes. Technical Committee on Cotton Quality *(invited)*
2008. Relationships of yield component variables to yield and fiber parameters. Cotton Incorporated Engineered Fiber Selection Conference.* *(invited)*
2008. Public cotton breeding programs. Cotton Breeders Fiber Quality Conference, Cotton Incorporated *(invited)*
2009. Cotton quality index. Technical Committee on Cotton Quality. *(invited)*
2009. Hairy-leaf cottons and leaf grade. Technical Committee on Cotton Quality *(invited)*

International: Presentations made by Bourland and his graduate students* include:

1989. Evaluation of cotton seed quality and avoidance of seed deterioration. Presented at Seminario Sobre Enfermedades del Algodonero, Centro de Investigacion y Desarrollo Agrario. Seville, Spain. *(invited)*
1989. Cotton seedling disease: A component of seedling vigor. Presented at Seminario Sobre Enfermedades del Algodonero, Centro de Investigacion y Desarrollo Agrario. Seville, Spain. *(invited)*
1994. Evaluation and development of resistance to the tarnished plant bug in cotton. International Plant Resistance to Insects – 11th Biennial Workshop.*

VI. Three Most Innovative Achievements:

1. Release of cotton germplasm lines and cotton varieties.

Bourland has been primarily responsible for the development and release of 54 cotton germplasm lines (34 lines since 2004) and one cultivar. These releases are chronicled in 34 registration articles in Crop Science Journal and the Journal of Plant Registrations. The breeding program has focused on combining various host plant resistance traits, enhanced combinations of yield component traits, and improved fiber quality into early-maturing, widely adapted, high yielding genotypes. The germplasm lines have been widely distributed and used by private and public cotton breeders throughout the world. In 2008, Cotton Incorporated initiated a program to increase seed of outstanding (on basis of yield performance and high fiber quality) advanced conventional lines from public cotton breeders. Eight of 14 lines chosen for this program over the past two years were developed by Bourland. One of these eight lines is currently being released as a conventional variety. In replicated tests over the three years (four sites per year), this new variety has yielded 5% more than DP 393, and produced fiber length of 1.29 in.(32.8 mm), length uniformity of 87.1%, and strength of 35.3 g/tex (346 kNm kg^{-1}). In the same tests, DP 393 had fiber length of 1.18 in. (30.0 mm), length uniformity of 84.8%, and strength of 31.7 g/tex (311 kNm kg^{-1}). This combination of high yielding ability and exceptional fiber quality in a short-season variety is unparalleled, and will surely have a great impact on the cotton industry.

2. Development of the COTMAN cotton management system.

COTMAN is a management system developed by a multiple disciplinary research team of which Bourland was one of four principal developers. Initially, his role was primarily the development of critical plant measurements and determining how cultivars differed with regard to these parameters. Since then, he has been integrally involved with training individuals to use COTMAN and with developing training materials. The COTMAN system is based upon monitoring and responding to plant growth and development. Resulting growth curves provide diagnostic insight on crop development through the season and identify pivotal stages of development. Combined with heat unit requirements and long-term weather patterns, COTMAN provides assistance with critical end-of-season

management decisions. Within COTMAN, the "nodes-above-white-flower" measurement is used to monitor maturation of the crop and to identify the flowering date of the last cohort of flowers that contribute significantly to yield. With this date identified, end-of-season management is based on the maturity of these last bolls. The "nodes-above-white-flower" concept is now widely used in making end-of-season decisions. Prior to boll weevil eradication and introduction of Bt cotton, use of COTMAN decision rules was shown to increase net returns by $46 to $53 per acre. Since then, net returns associated with COTMAN decision rules still exceed $20 per acre.

3. Development of cotton breeding techniques.

Bourland has been primarily responsible for developing several field and laboratory techniques that may be used to select and characterize cotton germplasm. Techniques that he has developed include: 1) Hot water technique to evaluate seed quality and resistance to seed deterioration, 2) Characterization of seedling vigor based on lateral root development, rapid true leaf formation, and resistance to seedling disease, 4) COTMAP, a modified whole plant mapping program used to characterize structure and fruiting parameters of cotton plants, 4) A rating system for characterizing leaf and stem pubescence of cotton genotypes, 5) A method for sampling and characterizing marginal bract trichomes of cotton genotypes, 6) COTVAR, an on-line program for summarizing data from cotton variety tests in all states, 7) Q-score a quantitative measure of cotton fiber quality that incorporates four weighed HVI measurements into one index, and 8) now working on maximizing the utility of basic yield components of lint per seed, fibers per seed, and fiber density. Additionally, he has assisted with the development of the "dirty-flower" technique for evaluating resistance to tarnished plant bug, and is currently working on improved techniques for evaluating resistance and/or tolerance to root-knot nematode, Verticillium wilt, and heat stress. Combined use of these techniques has been critical to the germplasm improvement made in his cotton breeding program.

VII. Biographical Sketch:

Fred Bourland was reared on a family cotton farm in northeast Arkansas where he was involved with all aspects of growing cotton. In his youth, he personally experienced planting fuzzy seed, blocking out emerged plants to desired plant densities, hand-weeding, and hand-picking. He later experienced the transition to more modern seeding methods, herbicides, and mechanical picking. He earned both his B.S. in agriculture (1970) and M.S. in plant breeding (M.S.) from the University of Arkansas. Under the direction of Dr. B.A. Waddle, his M.S. thesis project involved the characterization of cotton plant types for genetic studies. He then earned his Ph.D. in genetics under the direction of Dr. L.S. Bird from Texas A&M University in 1978. For his Ph.D. dissertation research, he studied the inheritance and interrelationships of several seed and seedling traits in cotton. In 1978, he became an Assistant Professor of agronomy at Mississippi State University, where he headed a cotton breeding program and had teaching responsibilities. During his tenure at Mississippi State, he was promoted to Associate Professor in 1983 and to Professor in 1987. He was hired as Professor of agronomy at University of Arkansas in 1988, and continued his cotton breeding research and teaching. In 1997, he transferred his breeding program from the main campus to the Northeast Research and Extension Center where he also serves as Center Director. He has been married to his wife, Kathy, for 40 years and they have one son, Samuel.