

Dr. Wayne Keeling  
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**Education:**

1985: Ph.D. Crop Science – Weed Science, Texas Tech University.  
1977: M.S. Weed Science, Texas Tech University.  
1974: B.S. Agronomy, Texas Tech University

**Professional experience:**

March 1986 – present: Project Leader, Cropping Systems, Texas AgriLife Research and Extension Center, Lubbock, Texas.  
November 1977 – March 1986: Research Associate, Weed Research, Texas Agricultural Experiment Station, Lubbock, Texas.  
May 1974 – November 1977: Technician, Weed Research, Texas Agricultural Experiment Station, Lubbock, Texas.

**Significant 5 Year Accomplishments (Research, Extension, Teaching):** Multi-year cropping systems studies evaluating new cotton cultivars, irrigation levels, and crop rotation were conducted at two locations. At the sandy soil site, where root-knot nematode populations are high, rotating cotton with wheat increased cotton yields 28-39% compared to continuous cotton. Higher yields were produced with resistant cultivars at a clay loam soil site where verticillium wilt populations are high. Higher yields were produced when cotton was rotated with sorghum and a partially resistant cultivar was planted. Increased irrigation levels increased verticillium wilt incidence. Transgenic cotton lines tolerant to dicamba + glufosinate (DGT) under development by Monsanto were evaluated for cotton tolerance and weed efficacy. Excellent tolerance to both dicamba and glufosinate were observed in DGT cotton, while the combination of glyphosate and dicamba provided effective Palmer amaranth and ivy leaf morning glory control. The addition of dicamba to glufosinate improved weed control compared to glufosinate alone. Field evaluations of Enlist (2, 4-D tolerant) cotton showed effective control of Palmer amaranth, devil's claw, and Russian thistle with post emergence treatments of Enlist Duo (2, 4-D choline + glyphosate) with good crop safety. A sorghum line tolerant to ALS herbicides was evaluated for improved weed control and tolerance to herbicide carryover from cotton herbicides. Field trials were conducted to evaluate systems of pre-plant incorporated, pre-emergence, and post-emergence residual herbicides for management of glyphosate-resistant Palmer amaranth populations. Additional fields with resistant weed populations were identified in 2015.

**5 Year Roadmap Metric Summary Avg per year:** 2 refereed journal articles, 12 proceedings, 2 technical, 3 grant reports, 15 grants submitted, \$275,000 industry, \$30,000 commodity, and \$30,000 state initiatives; Graduate students completing degrees – 2 M.S., Current Major Advisor – 2 Ph. D, 2 M.S.; 17 presentations at grower/extension/consultant meetings.

**Professional Activities (International, National, Regional, State):**

Southern Weed Science Society - Awards Committee  
Weed Science Society of America  
Reviewer – Weed Technology  
GAMMA SIGMA DELTA (TTU) – Member  
Texas Weed Investigators Group

**Research Summary 1986-2015**

61 Refereed journal articles  
481 proceedings/abstracts  
30 graduate students receiving degrees-directed research

### Honors and Awards

- 1994 USDA Group Award for Excellence – Team Research – Farming Systems Group, Lubbock.
- 1995 West Texas Agricultural Chemicals Institute – Award for Outstanding Contributions to Agricultural Chemical Industry.
- 2001 National Conservation Tillage Cotton and Rice Conference – Outstanding Cotton Conservation Tillage Researcher.
- 2008 Weed Scientist of the Year – Southern Weed Science Society.
- 2012 Texas A&M AgriLife – Vice Chancellors Award for Excellence in Research.
- 2013 Gamma Sigma Delta TTU Chapter – Outstanding Service to Agriculture.

### Publications (Ten most recent)

- Feng, Lu, F. Bufon, C.I. Mills, E. Hequet, J.P. Bordovsky, J. W. Keeling, R. K. Boman, and C.W. Bednarz. 2011. Effects of irrigation and plant density on cotton within-boll yield fiber quality. *Agron. J.* 103:2:297-303.
- Keeling, J.W., K.S. Verett, J.D. Reed, and P.A. Dotray. 2011. Cotton tolerance to propazine applied pre-and postemergence. *Weed Technol.* 25:178-182.
- Wheeler, T.A., J.P. Bordovsky, J.W. Keeling, and B.G. Mullinex, Jr. 2012. Effects of crop rotation, cultivar, and irrigation and nitrogen rate on Verticillium wilt in cotton. *Plant Disease.* 96:985-989.
- Keeling, J.W., B.D. Brown, J.D. Reed, and P.A. Dotray. 2013. Grain sorghum response to saflufenacil applied preemergence. *Crop Protection.* 46: 1-6.
- Snowden, C., G. Ritchie, J. Cave, W. Keeling, and N. Rajan. 2013. Multiple irrigation levels affect boll distribution, yield, and fiber micronaire. *Agron. J.* 105 (5).
- Wheeler, T.A., K.S. Lawrence, D.O. Porter, J.W. Keeling, and B.G. Mullinex Jr. 2013. The relationship between environmental variables and response of cotton to nematocides. *Journal of Nematology* 45:618-16.
- Reed, J. D., J. W. Keeling, and P. A. Dotray. 2014. Palmer amaranth (*Amaranthus palmeri*) management in GlyTol® Plus LibertyLink® Cotton. *Weed Technology.* 28:592-600.
- Wheeler, T. A., J. P. Bordovsky, J. W. Keeling, and J. E. Woodward. 2014. Effect of cropping systems on densities of *Verticillium dahliae*. *Journal of Cotton Science* 18:355-361.
- Manucheheri, M.R., J.E. Woodward, T.A. Wheeler, P.A. Dotray, and J.W. Keeling. 2015. First report of Russian thistle as a host for the Southern root-knot nematode in the United States. *Plant Health Progress* 16:1-2.
- Wheeler, T.A., J.P. Bordovsky, J.W. Keeling, J.G. Smith, and J.E. Woodward. 2015. An analysis of gross margins for management options of *Verticillium* wilt. *Cotton Journal of Cotton Science.* (in press).