

Muthu Bagavathiannan

Assistant Professor of Weed Science

Dept. of Soil and Crop Sciences, Texas A&M University, College Station, Texas

Education/Training

2009 PhD Weed Ecology, University of Manitoba, Canada

2005 MS Plant Genetic Manipulation, University of Nottingham, UK

2003 MS Agronomy, Tamil Nadu Agricultural University, India

2001 BS Agriculture, Tamil Nadu Agricultural University, India

Other Relevant Qualifications

2012 Diploma in International Development (with distinction), London School of Economics (External), UK

2007 Certificate in Higher Education Teaching, University of Manitoba, Canada

Positions and Employment

2014 to present - Assistant Professor, Soil and Crop Sciences, Texas A&M University, College Station

2014 Postdoctoral Research Associate, Department of Crop, Soil, and Environmental Sciences, University of Arkansas, Fayetteville

Program Overview

My research interests fall within the broader area of Weed Science and Agronomy, with particular emphasis on weed ecology and management. The threat of herbicide resistance is immense in broad-acre systems, leading to loss of effective herbicide options, increased herbicide use and unintended impacts on the broader environment. To this effect, the prime goal of my research program is to understand the evolutionary biology and dynamics of herbicide resistance in weed communities and develop integrated pest management (IPM) solutions encompassing chemical and non-chemical tactics to prevent/effectively manage herbicide resistance. I particularly use simulation modeling tools to answer some of the fundamental research questions surrounding herbicide resistance evolution and guide management decision-making. My research takes an inter-disciplinary approach in addressing knowledge gaps (problem-centric rather than discipline-centric) by integrating tools and knowledge from a wide range of disciplines. I actively collaborate with eminent research groups within and outside the United States. I currently teach Essentials for Plant Systematics and Management in Agronomy (SCSC 689) each summer and a graduate course in Weed Biology and Ecology (SCSC 651) every other spring.

Significant 5 Year Accomplishments

Research: As a PI or Co-PI, acquired \$4,725,606 of which \$728,447 went to my research program. Conducted basic and applied studies on herbicide resistance evolution and management in major agronomic weeds in row crops and rice. Assisted growers with information on effective tactics for resistance management. Confirmed multiple herbicide resistance in ryegrass in Texas wheat and resistance to ALS-herbicides in weedy rice in Texas rice. Developed a task-force to monitor and quarantine broomrape in Karnes county and surrounding areas. Since 2011, authored or coauthored 22 peer-reviewed journal articles and 3 book chapters. Teaching: Developed SCSC 689 with a focus on providing students with hands-on experience in weed science and preparing them for regional weed contests.

Publications

Ten most recent publications (34 total)

1. **Bagavathiannan MV**, Norsworthy JK (2016) Roadside Palmer amaranth populations can serve as conduits for the spread of herbicide resistance in agricultural landscapes. PLoS ONE (in press)
2. Willingham SD, **Bagavathiannan MV**, Carson KS, Cogdill TJ, McCauley GN, Chandler JM (2016) Evaluation of herbicide options for alligatorweed (*Alternanthera philoxeroides*) control in rice. Weed Technol (in press)
3. **Bagavathiannan MV**, Norsworthy JK, Tehranchian P, Riar DS (2015) Acetolactate synthase-inhibitor resistance in yellow nutsedge (*Cyperus esculentus*): I – phenotypic differences. Weed Sci 63:810-818 (*selected as a featured article*)
4. Tehranchian P, Norsworthy JK, **Bagavathiannan MV**, Riar DS (2015) Acetolactate synthase-inhibitor resistance in yellow nutsedge (*Cyperus esculentus*): II – physiognomy and photoperiodic response. Weed Sci 63:819-827 (*selected as a featured article*)
5. Korres NE, Norsworthy JK, **Bagavathiannan MV**, Mauromoustakos A (2015) Distribution of arable weed populations along eastern Arkansas Mississippi Delta roadsides: factors affecting weed occurrence. Weed Technol 29:596-604
6. Korres NE, Norsworthy JK, **Bagavathiannan MV**, Mauromoustakos A (2015) Distribution of arable weed populations along eastern Arkansas Mississippi Delta roadsides: occurrence, distribution and favored growth habitats. Weed Technol 29:587-595
7. Ward SM, Cousens RD, **Bagavathiannan MV**, Barney JN, Beckie HJ, Busi R, Davis AS, Dukes JS, Forcella F, Freckleton RP, Gallandt ER, Hall LM, Jasieniuk M, Lawton-Rauh A, Lehnhoff EA, Liebman M, Maxwell BD, Mesgaran MB, Murray JV, Neve P, Nunez MA, Pauchard A, Queenborough SA, Webber BL (2014) Agricultural weed research: a critique and two proposals. Weed Sci 62:672-678
8. Norsworthy JK, Griffith G, Griffin T, **Bagavathiannan M**, Gbur EE (2014) In-field movement of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) and its impact on cotton lint yield: evidence supporting a zero-threshold strategy. Weed Sci 62:237-249
9. **Bagavathiannan MV**, Norsworthy JK (2014) Pollen-mediated transfer of a herbicide resistance trait in barnyardgrass (*Echinochloa crus-galli* L.). Pest Manage Sci 70:1425-1431
10. **Bagavathiannan MV**, Norsworthy JK, Smith KL, Neve P (2014) Modeling the simultaneous evolution of resistance to ALS- and ACCase-inhibiting herbicides in barnyardgrass (*Echinochloa crus-galli*) in Clearfield[®] rice. Weed Technol 28:89-103 (*Selected as a featured article*)

Awards and Honors

- Associate Editor, Weed Science journal (2015)
- Outstanding Reviewer Award, Weed Science Society of America (2015)
- Outstanding Reviewer status, Crop Protection Journal (Elsevier) (2014)