

K.G. RAGHOTHAMA

GENERAL INFORMATION

Academic Appointments

1973-1977	BS (Horticulture), University of Agricultural Sciences, Bangalore, India
1977-1980	MS (Horticulture), University of Agricultural Sciences, Bangalore, India
1980-1981	Horticulture Extension Officer at the State Horticulture Department, Karnataka, India and Agriculture Extension Officer in a rural commercial bank
1981-1982	Graduate studies, University of California, Riverside
1982-1987	Graduate Student, Department of Horticulture and Landscape Architecture, Washington State University
1988-1992	Postdoctoral Research Associate, Department of Horticulture, Purdue University
1992-1998	Assistant Professor, Department of Horticulture and Landscape Architecture, Purdue University
1998-2002	Associate Professor, Department of Horticulture and landscape Architecture, Purdue University
2002-	Professor, Department of Horticulture and landscape Architecture, Purdue University
2007-	Associate Director, International Programs in Agriculture, Purdue University

Membership in Scientific, Professional and Honorary Organizations

American Society of Plant Physiologists
Sigma Xi
Gamma Sigma Delta

Awards and Patents

University Faculty Scholar for the years 2001-2006. This is a distinguished honor for a Purdue University faculty.

Purdue University, College of Agriculture Research Award for 2002. This is the highest award given in recognition of a research program in the college of Agriculture, Purdue University.

Patent filed by Purdue University for phosphate transporters and promoters.

Leadership training

Participating in LEAD21 leadership training program for 2006-2007

Research and International Engagement

The focus of Dr. Raghothama's research program is on understanding how plants acquire and respond to the mineral nutrient phosphate. Phosphorus is one of the most important, but least available plant mineral nutrients. Deficiency of phosphorus is global in nature but acute in tropical and subtropical regions. His program addresses the biochemical mechanisms by which plants absorb phosphorus from the soil solution and the molecular mechanisms involved in the plant's responses to phosphate deficiency. Dissecting signal transduction pathway during phosphate starvation response is one of the major focuses in his laboratory. His laboratory has made significant contributions in the area of molecular regulation of phosphate starvation response and phosphate transporters. Dr. Raghothama's lab was the first to identify and clone the phosphate transporter genes from a higher plant. The researchers in the field of phosphate regulated gene expression and signal transduction around the world closely follow the developments in his laboratory. Dr. Raghothama is recognized as one of the global leaders in this field of research. His laboratory is making a significant contribution to the interaction between sugar and phosphate in regulation root architecture. Furthermore the role of transcription factors induced during phosphate starvation is being dissected in his laboratory.

The unique attributes of phosphate deficiency around the world have opened exciting international research, outreach and engagement opportunities for Dr. Raghothama. He has been working with researchers, educators and administrators around the world. Many of these interactions have been supported by prestigious foundations such as BARD, McKnight Foundation and international agency such as USAID. He has research collaborations with EMBRAPA, Maize and Sorghum, Brazil and Moi University, Kenya. This collaboration has led to two international workshops in the area of phosphorus and exchange of scientists between EMBRAPA, Brazil and Purdue. The Rockefeller foundation recognized the importance of this work and authorized collaborators to organize two workshops on phosphorus nutrition in Africa. This collaborative research has resulted in a major grant from the McKnight Foundation to support research, education and outreach activities in Africa, Brazil and USA. They have recently renewed the project for four more years (2006-2010) by providing additional funds of \$800,000. In the second phase of the project the Purdue collaborators will be playing a very active role in Africa.

Dr. Raghothama has also established collaborative research and educational programs with scientists in India, Canada, Switzerland, France, Israel, China and Mexico. Several scientists from India, China, Brazil, Israel and South Korea have visited his laboratory to pursue research initiatives. In recognition of his involvement in international activities, Dr. Raghothama has been asked to serve as a member of Karnataka's Global Advisory Network Group for Agriculture, State of Karnataka, India. At present he is serving as the Purdue coordinator for Knowledge Initiative in Agriculture, India.

One of the highlights of Dr. Raghothama's involvement in international activities is the leadership in USAID-HED funded activity in India. This higher education partnership grant has helped in promoting the basic values of College of Agriculture, Purdue University. One of the major accomplishments of this program is the successful completion of a highly visible international symposium on "Biotechnology approaches for alleviating malnutrition and human

health". This symposium attracted nearly 300 delegates including 60 international participants. The details of this project activity can be viewed at the website: www.nutritionforall.org Furthermore, he is also collaborating with scientists from Israel. This collaboration was supported in part by a grant from the United States-Israel BARD Foundation. He is taking a very active role in Multinational Agricultural Research and Development focusing on Jordan, Israel, Palestine and USA. These activities have certainly promoted the role of College of Agriculture, Purdue University as an international leader in Agriculture and development.

Publications

Refereed Papers

- Devaiah B. N., A. S. Karthikeyan and K. G. Raghothama 2006. WRKY75 Transcription Factor is a Modulator of Phosphate Acquisition and Root Development in *Arabidopsis*. *Plant Physiol* (in press).
- Karthikeyan A S., D K. Varadarajan, Ajay Jain, M. A. Held, N. C. Carpita and K. G. Raghothama. 2006. Sugar is a positive regulator of phosphate starvation responses in plants *Planta* (In Press)
- Srivastava A. K., P. Venkatachalam, K. G. Raghothama and S. V. Sahi 2006. Identification of lead-regulated genes by suppression subtractive hybridization (SSH) in the heavy metal accumulator *Sesbania drummondii* *Planta* (In press)
- P. Venkatachalam*, A. Thulaseedharan* and K.G.Raghothama 2006 Identification of expression profiles of tapping panel dryness (TPD) associated genes from the latex of rubber tree (*Hevea brasiliensis* Muell. Arg.). *Planta* (In press)
- Nagy, R, Vasconcelos, MJV, Zhao, S, McElver, J, Bruce, W, Amrhein, N, Raghothama, K G, Bucher, M. 2006. Differential Regulation of Five Pht1 Phosphate Transporters from Maize (*Zea mays* L.) *Plant Biol*, 8: 186-198
- Raghothama KG, Karthikeyan AS 2005. Phosphate acquisition. *Plant Soil* 274 : 37-49
- Miura K, Rus A, Sharkhuu A, Yokoi S, Karthikeyan AS, Raghotham KG, Baek D, Koo YD, Jin JB, Bressan RA, Yun DY, and PM. Hasegawa. 2005. The *Arabidopsis* SUMO E3 ligase SIZ1 controls phosphate deficiency responses. *Proc. Natl. Acad. Sci. US* 102, 7760-7765
- Misson J, Raghothama KG, Jain A, Jouhet J, Block MA, Bligny R, Ortet P, Creff A, Somerville S, Rolland N, Doumas P, Nacry P, Herrerra-Estrella L, Nussaume L, Thibaud MC 2005. A genome-wide transcriptional analysis using *Arabidopsis thaliana* Affymetrix gene chips determined plant responses to phosphate deprivation. *Proc Natl Acad Sci, USA* 102: 11934-11939

- Jain A, Cao A, Karthikeyan AS, Baldwin JC and Raghothama KG. 2005. Phosphate deficiency suppresses expression of light-regulated psbO and psbP genes encoding extrinsic proteins of oxygen-evolving complex of PSII. *Curr Sci*. 89: 1592-1596.
- Misson J, Thibaud MC, Bechtold N, Raghothama KG and Nussaume L. 2004. Transcriptional regulation and functional properties of Arabidopsis Pht1;4, a high affinity transporter contributing greatly to phosphate uptake in phosphate deprived plants *Plant Mol Biol* 55: 727-741
- Sharma, N.C., Sahi, S.V., Jain, J.C., Raghothama, K.G. 2004. Enhanced accumulation of phosphate by *Lolium multiflorum* cultivars grown in phosphate-enriched medium. *Environ Sci Tech*, 38, 2443-2448.
- Bozzo GG, Raghothama KG, Plaxton WC 2004. Structural and kinetic properties of a novel purple acid phosphatase from phosphate-starved tomato (*Lycopersicon esculentum*) cell cultures. *Biochem J*. 377: 419-428.
- Saringhausen E, Karlson DT, Zeng Y, Goldsbrough PB and Raghothama KG, Ashworth AN. 2003. Characterization of a novel YSK class of dehydrin-like cDNAs from cold acclimated red-osier dogwood (*Cornus sericea* L.) xylem. *J Crop Improvement* 10: 17-35
- Karlson D, Saringhausen E, Zeng Y, Itoh T, Baba K, Fujino T, Joly R, Raghothama KG, Stirm V, Ashworth AE. 2003. Characterization and environmental regulation of a 24kDa *Cornus sericea* dehydrin-like protein and its relationship to freeze-tolerance. *Cryobiol Cryotech*. 1: 29-35.
- Karthikeyan AS, Varadarajan DK, Mukatira U, Matilda PD, Damaz B and Raghothama KG. 2002. Regulated expression of phosphate transporters in Arabidopsis. *Plant Physiol* 130:221-233.
- Varadarajan DK, Karthikeyan AS, Matilda PD and Raghothama KG. 2002. Phosphite an analog of phosphate suppresses the coordinated expression of genes under phosphate starvation. *Plant Physiol* 129:1232-1240
- Buzzo GG, Raghothama KG and Plaxton WC. 2002. Purification and characterization of two secreted purple acid phosphatase isozymes from phosphate-starved tomato cell cultures. *Eur J Biochem* 269:6278-6286.
- Thomas M, Raghothama, K.G. and Jacob J 2002. A simple and efficient method for the isolation of total RNA and mRNA from mature leaves of *Hevea brasiliensis*. *Indian Journal of Natural Rubber Research* 15:93-95.
- Mukatira U, Liu C, Varadarajan DK and Raghothama KG. 2001. Negative regulation of phosphate starvation induced genes. *Plant Physiology* 127:1854-1862.
- Mukatira U, Muchhal US, Baldwin JC and Raghothama KG. 2001. LeGRP1: A new member of glycine-rich proteins from tomato. *Physiol Plant* 113: 85-91

- Baldwin JC, Karthikeyan AS and Raghothama KG. 2001. LePS2, a phosphorus starvation induced novel acid phosphatase from tomato. *Plant Physiol* 125: 728-737.
- Raghothama KG. 2000. Phosphate acquisition: Plants in the driver's seat! *Trends Plant Sci* 5:412-413.
- Raghothama KG. 2000. Phosphate transport and signaling. *Curr Opin. Plant Biol.*3:182-187
- Raghothama KG. 1999. Phosphate acquisition. *Ann. Rev. Plant Physiol. Plant Mol. Biol.* 50: 665-693
- Muchhal US and Raghothama KG. 1999. Transcriptional regulation of plant phosphate transporters. *Proc.Natl.Acad. Sci.* 96: 5868-5872
- Biddinger EC, Liu C, Joly RJ and Raghothama KG. 1998. Physiological and molecular responses of aeroponically grown tomato plants to phosphorus deficiency. *J Amer. Soc Hort.* 123: 330-333.
- Liu C, Muchhal US, Mukatira U, Kononowicz AK and Raghothama KG. 1998. Tomato phosphate transporter genes are differentially regulated in plant tissues by phosphorus. *Plant Physiol.* 116:91-99.
- Muchhal US, Liu C and Raghothama KG. 1997. Calcium-ATPase is differentially expressed in phosphate starved roots of tomato. *Physiologia Plantarum* 101:540-544.
- Mukatira U., U.S. Muchhal and K.G. Raghothama. 1997. Cloning of *Arabidopsis thaliana* phosphate transporter gene, AtPT2 (Accession No. AF022872). *Plant Physiol* 115:1288.
- Liu C, Muchhal US and Raghothama KG. 1997. Differential expression of TPSI1, a phosphate starvation-induced gene in tomato. *Plant Mol Biol* 33: 867-874.
- Raghothama KG, Kononowicz AK, Maggio A, Narasimhan ML, Wang G, Hasegawa PM and Bressan RA 1997. Tissue specific activation of the osmotin gene by ABA, ethylene and NaCl involves the same promoter region. *Plant Mol Biol* 34:393-402.
- Watad AA, Raghothama KG, Kochaba M, Nissim A and Gaba V. 1997. *In vitro* growth and shoot multiplication of *Spathiphyllum* and *Syngonium* are facilitated by use of interfacial membrane rafts. *HortScience* 32:307-308.
- Liu C, Raghothama KG 1996: A practical method for cloning cDNAs generated in a mRNA differential display. *Biotechniques* 20: 576-579.
- Muchhal US, Pardo JM, Raghothama KG 1996: Phosphate transporters from the higher plant *Arabidopsis thaliana*. *Proc Natl Acad Sci, USA* 93: 10519-10523.

- Liu C, Raghothama KG 1995. Cloning and characterization of pTPSI1, a cDNA for a phosphate starvation induced gene from tomato. *Plant Physiol* 109: 1126-1127.
- Liu D, M.L. Narasimhan, Yi Xu, K.G. Raghothama, P.M. Hasegawa and R.A. Bressan 1995. Fine structure and function of the osmotin gene promoter. *Plant Mol Biol* 29:1015-1026.
- Xi Yu, D. P.F. Chang, Liu, M. Narasimhan, K.G. Raghothama, P.M. Hasegawa and R.A. Bressan. 1994. Plant defense genes in separate signal transduction pathways are synergistically induced by ethylene and jasmonate. *Plant Cell* 6:1077-1085.
- Liu D, Raghothama KG, Hasegawa PM, Bressan RA 1993. Resistance to the pathogen *Phytophthora infestans* in transgenic potato plants that over-express osmotin. *Proc Natl Acad Sci USA* 91:1888-1892
- Raghothama KG, Liu D, Nelson DE, Hasegawa PM, Bressan RA 1993. Analysis of an osmotically-regulated pathogenesis-related osmotin promoter, *Plant Mol Biol* 23:1117-1128
- Casas, A.M., D.E. Nelson, K.G. Raghothama, M. Paine D'Urzo, N.K. Singh, R.A. Bressan, and P.M. Hasegawa. 1992. Expression of osmotin-like genes in the halophyte *Atriplex nummularia* L. *Plant Physiol.* 99: 329-337.
- Nelson, D.E., K.G. Raghothama, N.K. Singh, P.M. Hasegawa, and R.A. Bressan. 1992. Transcriptional activation of an osmotin gene by hormonal and environmental signals. *Plant. Mol. Biol.* 19:577-588.
- Raghothama, K.G., K.A. Lawton, P.B. Goldsbrough, and W.R. Woodson. 1991. Characterization of an Ethylene-regulated flower senescence-related gene from carnation. *Plant Mol. Biol.* 17:61-72.
- Lawton, K.A., K.G. Raghothama, P.B. Goldsbrough, and W.R. Woodson. 1990. Regulation of senescence-related gene expression in carnation flower petals by ethylene. *Plant Physiol.* 93:1370-1375.
- Raghothama, K.G., A.S.N. Reddy, M. Friedmann, and B.W. Poovaiah. 1987. Calcium-regulated *in vivo* protein phosphorylation in *Zea mays* L. root tips. *Plant Physiol.* 83:1008-1013.
- Raghothama, K.G., K. Veluthambi, and B.W. Poovaiah. 1985. Stage-specific changes in calcium-regulated protein phosphorylation in developing tomato fruits. *Plant Cell. Physiol.* 26:1565-1572.
- Raghothama, K.G., Y. Mizrahi, and B.W. Poovaiah. 1985. Effect of calmodulin antagonists on auxin-induced elongation. *Plant Physiol.* 79:28-33.

Manuscript submitted to scientific journal:

Jain A, M. D. Poling, A. S. Karthikeyan, J. J. Blakeslee, W. A. Peer, B. Titapiwatanakun, A. S. Murphy, K. G. Raghothama. 2006. Effects of Sucrose and Auxin on Localized Pi-deficiency Induced Modulation of Different Traits of Root System Architecture in Arabidopsis. *Plant Physiol* (provisionally accepted with revision)

Guo-hua Xu, V. Chague, C. Melamed-Bessudo, Y. Kapulnik, A Jain, K.G. Raghothama, A. Levy, A. Silber 2006. Functional Characterisation of LePT4: a Phosphate Transporter in Tomato with Mycorrhiza-Enhanced Expression (submitted to *J. Exp.Bot*)

Book chapters and symposium articles:

Ajay Jain, Maria Jose Vasconcelos, Shivendra V. Sahi and K.G. Raghothama 2006. Molecular mechanisms of plant adaptation to phosphate deficiency. *Plant Breeding Reviews* (in press)

Raghothama KG and AS Karthikeyan 2006. Phosphate acquisition in Root Physiology—From Gene to Function. Lambers, H. & Colmer, T.D. (eds) Kluwer Academic Publishers (In press)

Raghothama KG 2005. Phosphorus and plant nutrition: An overview. In “Phosphorus: Agriculture and the Environment” a monograph from the American Society of Agronomy-Crop science Society of America and Soil Science Society of America. pp 355-378

Raghothama KG 2005. Phosphorus. In *Plant Nutritional Genomics*. Eds. Martin Broadley, and Philip White, Blackwell Publishing.

K.G. Raghothama. 2002. Phosphate acquisition: A biological process regulated at molecular level. In *Reviews in Plant Biochemistry and Biotechnology*. Eds. A. Goyal, S.L. Mehta and M.L. Lodha. Soc Plant Biochem Biotech. New Delhi

K.G. Raghothama. 2000. Plant nutrition in the Genomics era! Published in the *Proceedings of the Fertilizer Industry Round Table held at New Orleans, LA*. (Oct 4-6).

K.G. Raghothama. 2000. Molecular Determinants of phosphate acquisition and their utility in crop improvement. *Proc of Workshop on Improving phosphorus acquisition efficiency in marginal soils*. EMBRAPA, Sete Lagoas, MG, Brazil. in press.

Raghothama K.G. 1999. Molecular regulation of phosphate acquisition in plants. In *Plant Nutrition-Molecular Biology and Genetics*. eds Nielsen GG and A Jensen. Kluwer Academic. Boston, USA. pp. 95-103.

Liu, C. and K.G. Raghothama. 1999. Practical methods for cloning cDNAs generated in an mRNA differential display. In *Expression Genetics, Differential Display*, eds. A.B. Pardee and M. McClelland. Eaton Publ. Natic, MA. pp. 477-480.

- Raghothama K.G. 1999. Phosphate transporters; molecular tools for enhancing phosphate uptake by plants in acid soils. In Proc of workshop on Sustainable crop production in acid savannas and other problem soils of the world. ed. R.E. Schaffert. Purdue Uni. Press, West Lafayette, IN. pp.79-86.
- Raghothama K.G., U.S. Muchhal, D.H. Kim and Marcel Bucher. 1998. Molecular regulation of plant phosphate transporters. Phosphorus in Plant Biology, Regulatory roles in molecular, cellular, organismic, and ecological process. 1998 Penn State Summer Symposium in Plant Physiology pp. 271-280. Amer. Soc. Plant Physiol. Rockville MD.
- Muchhal U.S., D. Varadarajan, B. Damsz and K.G. Raghothama. 1998. Tomato phosphate transporter (LePT1) is localized in plasmamembranes. Phosphorus in Plant Biology, Regulatory roles in molecular, cellular, organismic, and ecological process. 1998 Penn State Summer Symposium in Plant Physiology pp 365-366. Amer. Soc. Plant Physiol. Rockville MD.
- Raghothama K.G. Molecular responses of plants to phosphate deficiency. 1997. In Proceedings of the 47th Annual Meeting Fertilizer Industry Round Table pp. 88-92
- Kononowicz A.K., K.G. Raghothama, A.M. Casas, D.E. Nelson, D. Liu, M.L. Narasimhan, P.C. Larosa, N.K. Singh, R.A. Bressan, and P.M. Hasegawa 1994. Structure, regulation and function of the osmotin gene. In Biochemical and Cellular mechanisms of stress tolerance in plants, Cherry JH and Monti L (eds) NATO ASI Series Vol. 86, pp. 381-414. Springer-Verlag, Berlin.
- Kononowicz A.K., K.G. Raghothama, A.M. Casas, M. Reuveni, A.E.A. Watad, D. Liu, R.A. Bressan, and P.M. Hasegawa. 1993. Osmotin:regulation of gene expression and function. In Close TJ, Bray EA (eds) Plant Responses to Cellular Dehydration during Environmental Stress. American Soc. Plant Physiol. pp 144-157.
- Woodson, W.R., K.A. Lawton, R.C. Meyer, Jr., K.G. Raghothama, and P.B. Goldsbrough. 1990. Regulation of gene expression in senescing carnation petals. In Horticultural Biotechnology, A.B. Bennett (ed), Alan Liss Pub. pp. 203-212.
- Embleton T.W., M. Matsumura, D.R. Atkin, J.E. Pehrson, N.V. O'Connell, J. Maranto, J. Edstrom, M.E. Galindo, G.A.H. Hamid, and K.G. Raghothama. 1984. Comparison of Allied Chemical Corporations' registered nutrient sprays with currently recommended sprays. Proc. Int. Soc. Citriculture 1: 163-166.

Invited Presentations (International presentations are shown in bold)

Invited speaker or presenter

Key note speaker: Dong A University, Pusan, South Korea 2006

University of Ghana, Accra, Ghana 2006

3rd International Symposium on Phosphorus Plant-Soil continuum, Brazil 2006

Key note Speaker: Multinational Agricultural Research and Development Symposium, Amman, Jordan 2006

Bethlehem University (UNESCO Center), Palestine 2006

Hebron University, Palestine 2006

ARO center, Israel 2006

Galilee Research Center, Israel 2006

Cornell University, Ithaca NY 2005

ALO Synergy Symposium, Washington DC 2005

ARO, The Volcani Center, Bet Dagan, Israel 2005

The Weizmann Institute, Rehovot, Israel 2005

EMBRAPA, Sate Lagos, Brazil 2005

**Participant: Global Horticulture Assessment, Regional Workshops
Cairo Egypt 2005**

Participant: McKnight Foundation Presentation EMBRAPA, Sate Lagos, Brazil 2005

Participant: US-India Collaborative partnership Bangalore, India 2005

University of Agricultural Sciences, Bangalore, India 2004

Ohio State University 2004

Keynote speaker: McKnight symposium, South China Agriculture University, Ganzao, China 2003

Keynote speaker: 2nd Internatinal symposium on phosphorus, 2003, Perth, Australia

University of Tennessee, Knoxville. Mar. 2003

CCA meeting at Indianapolis, IN. Dec. 2002

University of Missouri, Columbia Oct 2002

University of West Virginia, Morgantown. Sept. 2002

University of Illinois, Urbana Champaign, Oct. 2002

Danforth Center, St. Louis, Oct. 2002.

Pioneer HiBred Internationl, May 2002

Symposium on Cellular signaling. Indian Institute of Science, Bangalore, India July 2002

UNILEVER Corp. Bangalore India. July 2002

University of Agricultural Sciences, Bangalore, India July 2002

5th International Symposium on plant:soil interactions at low pH. March 2001. South Africa.

Rockefeller foundation workshop on phosphorus. March 2001. South Africa.

University of Agriculture Sciences, Bangalore. July 2001

University of Agricultural Sciences, Dharwad July 2001

Rubber Research Institute, Kottayam, India July 2001

Indian Institute of Science, Bangalore, India July 2001

American Society of Plant Physiologists meetings at Providence, RI.

Department of Biology, Western Kentucky Uni. Bowling Green Sept. 2001

Department of Biology, Calvin College, Grand Rapids MI Sept. 2001

USDA, ARS, Beltsville, MD. Oct. 2001

Pioneer Hi-Bred International, Johnston, Iowa, Dec. 2001

Department of Biology, Texas A&M University, March 2000

Department of Biology, University of Guelph, Canada, April 2000

Department of Biology, University of Toronto, Canada, April 2000

Dept. of Biology, Queens University, Kingston, Canada April 2000

Dept. of Biology, University of Minnesota, Duluth, April 2000.

Dept of Botany and Plant Pathology, Purdue University, Nov. 2000

Key note speaker: Fertilizer Round Table, New Orleans, LA. Oct. 2000.

Phosphorus nutrition in the genomics era. Research retreat, March 26, 1999. Dept. of Horticulture and Landscape Architecture, Purdue University.

Phosphate acquisition. July 8,1999. Madhurai Kamraj University, Madhurai, India.

Molecular regulation of P uptake in plants. July 10, 1999. University of Agricultural Sciences. Bangalore, India.

Invited Speaker and Chair of the minisymposium: Phosphorus. American Society of Plant Physiology Annual Meetings at Baltimore. July 25, 1999.

Phosphorus Workshop at Embrapa, Sate Lagos, Brazil. 1999

Pioneer Hibred International. Molecular characterization of plant phosphate transporters. March 1998.

Monsanto, St.Louis. Phosphate transporters. April 1998

Phosphorus in Plant Biology, Regulatory roles in molecular, cellular, organismic, and ecological process. 1998 Penn State Summer Symposium in Plant Physiology.

Keynote speaker: State of Science: Genetic and physiological nature of P uptake efficiency of plants in acid soils. Workshop to develop a strategy for collaborative research and dissemination of technology in sustainable crop production in the acid savannas and other problem soils of the world. May 1998. Purdue University.

Keynote Speaker: 6th International Symposium on Molecular biology and Genetics of plant Nutrition, Elsinore, Denmark. August 1998.

Department of Agronomy, Purdue University, spring 1997.

Department of Biology, Purdue Calumet, Hammond IN.

Department of Biotechnology, University of Agricultural Sciences, Bangalore India. Summer of 1997.

Department of Biochemistry, Indian Institute of Science, Bangalore, India. Summer of 1997.

The Fertilizer Industry Round Table, Tradewinds Resort, St. Pete Beach, St. Petersburg, Florida. October 1997.

Workshop on transgenic plants: Biology and applications. Tuskegee University, Alabama. April 20-22, 1996.

Physiology Seminar series, University of Illinois, Urbana-Champaign on October 16, 1996.

Research Grants Received (Participated in research activity supported by 2.64 million dollars of external grants in the last five years)

Funding from External Sources:

Year Received	Source of grant	Amount
2006-2010	McKnight Foundation, collaborative research with Brazil Africa and Cornell Uni. (Purdue collaborators: Cliff Johnston and Darrel Schultz, Agronomy Dept.)	\$800,000*
*The amount (\$800,000) represents the total grant obtained by the group.		
2006	University of Western Kentucky	\$ 25,000
2005	University of Western Kentucky	\$ 25,000
2004	USDA-NRC	\$ 85,000
2004	USAID, India project	\$300,000
2003	University of Western Kentucky	\$ 15,000
2003	USDA	\$145,000
2002	University of Western Kentucky	\$ 15,000
2002-2006	McKnight Foundation, collaborative research with Brazil Mexico, Africa and Cornell Uni. (Purdue collaborators: Cliff Johnston and Darrel Schultz, Agronomy Dept.)	\$880,000*
*The amount (\$880,000) represents the total grant obtained by the group.		
2001-2004	BARD (US-Israel research partnership)	\$170,000
2000-2003	USDA-NRI competitive grant (3 years)	\$180,000
1999-2000	NASA (co principal investigator)	\$ 21,000
1998-1999	Mid America Food Processors	\$ 5,000
1997-1998	Mid America Food Processors	\$ 2,500
1996-1997	USDA-NRI competitive grant (3 years)	\$168,800
1996-97	Mid America Food Processors Association	\$ 3,500
1995-96	North Central Region Sustainable Agriculture Research and Extension (SARE for 2 years) (Co-principal investigator with Dr. S.C. Weller)	\$ 70,000
	Small Business Innovation Res. U.S. EPA Raghothama (Co-PI) and B.C. Joern, Dept. of Agronomy	\$ 36,000
1994-95	Mid America Food Processors Association DOE-ERLE equipment grant	\$ 2,000
		\$ 1,250
1993-94	USDA (3 years) Mid America Food Processors Association	\$138,000 \$ 1,500
1992-93	Midwest Plant Biotechnology Consortium (Co-PI with R.A. Bressan and P.M. Hasegawa)	\$400,000

Funding from Purdue University:

Year	Source of funding	Amount
2006	PRF graduate student fellowship	\$ 15,292
2005	International Travel Grant	\$ 1,000
2004	Ross Graduate student fellowship	\$ 14,000

2003	Ross Graduate student fellowship	\$ 14,000
2004	USAID match	\$296,000
2002	McKnight Match	\$145,000
2002	Agriculture Research Award	\$ 5,000
2001-2006	Support for University Faculty Scholar	\$ 50,000
2001-	PRF research grant	\$ 26,140
2000-2001	International Travel Grant	\$ 1,470
1999-2000	Genomics Research Initiative	\$ 5,000
1998-1999	Purdue Global Research Initiative Faculty Grant	\$ 2,500
1997-1998	Purdue Global Initiative Faculty Grant	\$ 2,500
	SAMGSRRC	\$ 5,000
	PRF Research Grant	\$ 23,332
1996-1997	Undergraduate research grant	\$ 1,000
	Agricultural Research Fund Scholarship to support Undergraduate research work.	
		\$ 500
	NSF Scholar research support	\$ 250
1995-1996	ARP Fellowship	\$ 24,000
	"Analysis of transcriptional activation and function of a phosphate starvation induced gene."	
	Undergraduate research grant to support	\$ 500
1994-1995	Library Scholars Grant Program	\$ 200
1993-1994	Undergraduate Research Program grant	\$ 1,000
1992-1993	ARP Fellowship	\$ 24,000
	Library Scholars Grant Program	\$ 200
	Undergraduate Research Program grant to support	
	PRF travel grant	\$ 1,300

Involvement with Education

Dr. Raghothama is committed to internationalization of undergraduate and graduate education at Purdue University. He is currently advising five Ph.D. students in his laboratory and serving as a member on several graduate student committees.

A. Major professor for 10 Ph.D. students

- 1) Chunming Liu
- 2) Mukatira Uthappa, Ph.D
- 3) James Baldwin, currently enrolled in Ph.D. program
- 4) Deepa Varadarajan,
- 5) Maria Jose Vilaca de Vasconcelos
- 6) Aiquin Cao. Currently enrolled in Ph.D. program
- 7) James Ward “
- 8) Devaiah BN “
- 9) Madhuvanathi Ramaiah “
- 10) Vinay Nagarajan “

B. Post doctoral advisor for 5 international scientists

- 1) Dr. Umesh Muchhal
- 2) Dr. Reena Randhir
- 3) Dr. A.S. Karthikeyan
- 4) Dr. Ajay Jain
- 5) P. Venkatachalam
- 6) Tian Jiang

Mentorship for International Visiting Scientists

Numerous International scientists from around the world have spent time in Dr. Raghothama laboratory as visiting scholars.

Dr. Doh-Hoon Kim, Assistant Professor, Dong-A University, Pusan, Korea. Dr. Kim spent one month in my laboratory during the summer of 1996.

Dr. Abed Watad, The Volcani Center, Bet Dagan, Israel. Conducted research on molecular biology of vernalization of lilly in my laboratory during 1995-1996.

Dr. Doh-Hoon Kim, Visiting Professor, Dong-A University, Pusan, Korea, spent one year of sabbatical in the laboratory during 1997-98. He conducted research on molecular response of cultured tomato cells to phosphorus deficiency.

Mr. Yeon Sup Kim, Visiting scientist, Yonsei University, Seoul, Korea. Mr. Kim spent three months in laboratory.

Ms. Maria Jose Vilaca de Vasconcelos, EMBRAPA, St. Logos, Brazil. As a visiting scientist spent 3 weeks in the laboratory working on expression of Pi transporters in maize and sorghum.

Dr. Robert Schaffert, Visiting Professor, EMBRAPA, St. Logos, Brazil. Spent part of his sabbatical in his laboratory.

Ms. Maria Jose Vilaca de Vasconcelos, EMBRAPA, St. Logos, Brazil. 4 months (1999) to work on expression of Pi transporters in maize and sorghum

Dr. Venkataramanan, Head, Division of Plant Physiology, Central Coffee Research Institute, India. Visited his lab for two weeks in 1998.

Dr. Molly Thomas, Plant Physiologist, Rubber Research Institute, Kottayam, India. 6 months (2000-2001)

Dr. Venkatachalam, RRII, 2004 3 months

Dr. Fernando Nicolosa, Brazil, 2004 12 months

Dr. Venkatachalam, Rubber Research Institute, India, 2 years (2005-2007)

Dr. Tian Jiang, South China Agricultural University, China. Two year (2005-2007)

Dr. Theertha Prasad, University of Agricultural Sciences, Bangalore, India 2005

Committee member for Graduate Students:

Dr. Raghothama is often sought to serve as a member and chairperson for thesis committees and prelim exams. **He has served or serving on the MS and Ph.D. thesis committees of over 35 students**

Thesis committee

- | | |
|---------------------|-------|
| 1) Aaron Smith | Ph.D. |
| 2) Zhu Jianhua | Ph.D |
| 3) Cicero Deschamps | Ph.D |
| 4) Gregory Peel | Ph.D |

5) Tanya Quist	Ph.D.
6) Metha Meetam	Ph.D.
7) Preekamal Klarnit	Ph.D.
8) Adam Santone	Ph.D.
9) Synan F. Abu Qumar	MS
10) Polly Kaufmann	Ph.D.
11) Rafaela Ruiz Heras	MS 2002
12) Dale Karlson	Ph.D 2001
13) Hyeseung Lee	Ph.D 2001
14) Lisa Bushue	MS 2000
15) Farah Heraux	MS 1999
16) Rodrigo Sarria-Millan	Ph.D 1998
17) Vicki M. Racicot	MS 1997
18) Weenun Bundithya	Ph.D 1998
19) Winthrop B. Phippen	Ph.D 1998
20) Roberto Fontes Vieira	Ph.D 1998
21) Zhigang Hao	Ph.D 1998
22) Amanda Brandt	MS 1997
23) Chad Hutchinson	Ph.D 1997
24) Iulia Kovari	Ph.D 1997
25) Whipker Brian	Ph.D 1995
26) Aparna Bhaskaran	Ph.D.
27) Srinivasan	Ph.D.
28) Kess Berg	Ph.D
29) Anandita Banerjee	Ph.D.
30) Nahla El-Sherif	Ph.D
31) Josh Blakeslee	Ph.D.
32) Na, Gun-nam	Ph.D.
33) Sofia Lissbrant	Ph.D
34) Amy Marshall	Ph.D.

Preliminary Examination Committee member

1) Cicero Deschamps	2001
2) Zhiping Deng	2000 Chairman
3) Ben DeRidder	2000 Chairman
4) Dale Karlson	1999 Chairman
5) Aaron Smith	1999 Chairman
6) Hyeseung Lee	1998
7) Rodrigo Sarria-Millan	1998
8) Weenun Bundithya	1997 Chairman
9) Roberto Fontes Vieira	1997
10) Vicki M. Racicot	1996
11) Iulia Kovari	1995
12) Dolly Bell Lelong	1994
13) Denise Tieman,	1993
14) Yi Yu,	1993
15) Niu Xiaomu	1993

16) Zutang Chen	1993
17) Cindy Flinn	1993
18) Dong Liu	1993
19) Guo WJ	2002
20) Preekamal Klarnit	2002

International Collaborative Research Efforts

Dr. J.M. Pardo, Instituto de Recursos Naturales y Agrobiologia, C.S.I.C., Apdo. 1052, Sevilla-41080, Spain. Project: Molecular responses of plants to phosphate starvation.

Dr. Robert Schaffert: EMBRAPA, Brazil. Genetic variations in P uptake by maize and sorghum genotypes.

Dr. Bill Plaxton: Queens University, Kingston, Canada. Molecular regulation of plant phosphatases

Dr. Avi Levy, Weizmann Institute, Israel. Characterization of *LePT3*, the third member of tomato phosphate transporters.

Dr. Avner Silber. BARD research partner

Dr. Teertha Prasad: University of Agriculture Sciences, Bangalore, India. Improvement of phosphorus efficiency in plants.

Dr. Molly Thomas. Rubber Research Institute. IRRI, Kottayam, India.

Member of the Purdue Research group interacting with Dept. Agric. Production, Iwate University, Japan.

Several Faculty members: University of Agricultural Sciences, Bangalore, India

Dr. Xiaolong Yan, South China Agricultural University, China

Dr. Nussaume Laurent, CEA Cadarache, France

Dr. Sam Gudu, Moi University, Kenya

Dr. Dong Liu, Tsinghua University, China

Leadership and Administrative activities

Panel Chairperson: United States-Israel Binational Agricultural Research and Development Fund **2001**

Panel Chairperson: United States-Israel Binational Agricultural Research and Development Fund **2003**

Panel Chairperson: United States-Israel Binational Agricultural Research and Development Fund **2004**

Panel Member: BARD 2002

Panel member: USDA-NRI panel. **1998**

Panel member: USDA-NRI panel. **2002.**

Reviewer: NSF, USDA, DOE, BARD and USDA-SBIR grant proposals.

National Services and Engineering Research Council of Canada, research proposal.

Advisory member: Karnataka's Global Advisory Network Group for Agriculture, State of Karnataka, India.

Member of the Martin Gibbs Medal Award Committee, ASPB 2002-2007

**Member, organizing committee Multinational Agricultural Research Development
Jordan, Israel, Palestine and USA) symposium at Amman, Jordan
Technical Consultant International Atomic Energy Agency**

Departmental Committees and Positions

1. Chairman, Graduate Steering committee
2. In charge of Department of Horticulture Plant Tissue Culture Facilities 1998-present.
This is one of the major service facilities in the Department of Horticulture and Landscape Architecture.
3. Organizer the Third Annual HLA Research Retreat 2000
4. Teaching committee, member 1992-96, 2000-
5. Member, Space planning committee 2000-
6. Plant Growth Facilities Oversight committee 1998-
7. Horticulture Seminar committee, member 1992-96, 2000-01
8. Departmental Graduate Steering committee, member 1997-2000
9. Horticulture Seminar committee, Chairperson 1993-94.
10. Safety and Hazards Committee, Chairperson 1994-1998
11. Departmental Curriculum Committee, 1996-97
12. Member, Search Committee for the Assistant Professor,
Reproductive biology position.
13. Member, Search committee for the Assistant Professor of plant genomics.
14. Member, Search committee for Plant Growth Facility Manager
15. Member, Search Committee for Plant Nutrition Faculty in Agronomy
16. Chairperson, Search committee for Research Professor in Horticulture
17. Search committee for the Department Head, HLA
18. Undergraduate Student Advisor

School and University Committees

1. Member, Graduate Education Road-mapping Committee
2. Member, Graduate Council in Agriculture, College of Agriculture
3. Organizing committee member, International Workshop on Sustainable Agriculture on
Marginal lands, Purdue University Spring of 1998
4. School of Agriculture Minority Graduate Student Recruitment and Retention
Committee, 1997-2001
5. School of Agriculture Grievance Committee, 1997
6. Faculty Representative to Commencement, 2000
7. Faculty representative to discuss the professional life at Purdue with new faculty
joining the College of Agriculture in 1997, 2000
8. Member, College of Agriculture Honors and Dean Scholars committee

Consulting activities with industry, etc.

Norsk Hydro Research Center ASA, Oslo, Norway. Exploration of application of modern agricultural biotechnology to improve nutrient acquisition.

TEACHING

Dr. Raghothama has made significant contributions to teaching in the Department of Horticulture and Landscape Architecture, and within the interdisciplinary Plant Biology graduate training program at Purdue University. At the undergraduate level, Dr. Raghothama has developed and implemented a new course in plant nutrition. He actively involves undergraduates in his research program, which has led to a number of student research awards and a refereed paper. At the graduate level, Dr. Raghothama contributes to the team teaching of Biophysical Plant Physiology, a core course in both the Horticulture and Plant Biology graduate programs. In addition, he has developed a number of instructional laboratories for the Methods in Plant Science Research course taught within the Department of Horticulture and Landscape Architecture. He is committed to continued growth as an effective teacher and a dedicated mentor to students.

Courses Taught

HORT 551	Biophysical Plant Physiology
HORT 590M	Methods in Plant Science Research
HORT 513:	Mineral Nutrition of Horticultural Crops.
HORT 694	Graduate Seminar
HORT 491	Undergraduate Research