

CURRICULUM VITAE

Name: ***Carl E. Pray***

Title: Professor II

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EDUCATION

Ph.D., 1978, Economic History, University of Pennsylvania

Undergraduate Economics, University of Iowa, 1/72-5/72

B.A., 1969, History, Carleton College, Northfield, Minnesota

Asian History, University of Singapore, 6/67-2/68

EXPERIENCE

Visiting Scholar, Department of Agriculture and Resource Economics and Energy Biosciences Institute, U. of California, Berkeley 2008-2009

Chair, Department of Agriculture, Food and Resource Economics, Rutgers University, September 2005 to 2008

Professor II, Department of Agriculture, Food and Resource Economics, Rutgers University, July 2005 to present

Professor I, Department of Agriculture, Food and Resource Economics, Rutgers University, 1998 to June 2005 .

Director of the Graduate Program in Food and Business Economics, Rutgers University, 2001-2005

Adjunct Professor and Advisor, Ph.D. Program, Center for Chinese Agricultural Policy, Chinese Academy of Sciences. January, 2003 to December 2005.

Visiting Professor of Public and International Affairs, Woodrow Wilson School, Princeton University. February to July 2003.

Research Fellow, Rural Development Research Consortium. University of California, Berkeley. October 2002 to Present.

Visiting Research Fellow, Economic Research Service, USDA. July 1999 to June 2000.

Guest Professor, Economics and Trade College, Zhejiang Agricultural University, Hangzhou, Zhejiang, People's Republic of China. May, 1995.

Visiting Fellow, Economic Growth Center, Yale University, July 1992 to June 1993.

Associate Professor, Department of Agricultural Economics and Marketing, Rutgers University, January 1986 to 1998.

Graduate Director, Department of Agricultural Economics and Marketing, Rutgers University, September 1989 to 1990.

Full Member of the Graduate Faculty of the Department of Economics, Rutgers University, 1987 to present.

Research Associate, Private Sector Innovation and Technology Transfer, Agricultural and Applied Economics Department, University of Minnesota, 1984 to 1986.

Research Associate, Asian Agricultural Research Project, Agricultural and Applied Economics Department, University of Minnesota, November 1980 - 1984.

Associate, Bangladesh, Agricultural Development Council, Inc. Conducted research on the economics of agricultural research, technology assessment, irrigation policy and the pricing of agricultural inputs and outputs for Bangladesh Ministry of Agriculture and Bangladesh Planning Commission. Managed a small research grant and scholarship program, November 1978 - October 1980.

Lecturer, Economics Department, Rutgers University, Spring, 1978.

Instructor, Economics Department, University of Pennsylvania, Fall, 1977.

Peace Corps Volunteer, Rajasthan, India, 1969-71. Village level agricultural extension work with farmers and local officials to spread the use of modern farming techniques.

AWARDS

President, 2008-2010. International Consortium for Applied Bioeconomy Research (ICABR).

Special Service Award 2004, Association for International Agriculture and Rural Development, National Association of State Universities and Land-Grant Colleges.

Award for Outstanding Scientific Progress, Ministry of Agriculture of China, 1999 for publications on Agricultural R&D Policy (with Jikun Huang, Scott Rozelle, and Ruifa Hu).

Leader, Team Residency, The Rockefeller Foundation, Bellagio Study and Conference Center. July, 1999.

Visiting Fellow, Economic Growth Center, Yale University, July 1992 - June 1993.

Thesis selected one of the five best Ph.D. theses in 1978/79 by American Economic History Association.

Fulbright Fellowship for dissertation research in London and Pakistan, 1975-76.

NDEA Title VI Fellowship, 1972-75.

FIELDS OF CONCENTRATION

Science and Technology Policy

Agricultural Policy

Economic Development

PUBLICATIONS AND PAPERS

Books and Monographs

Carl E. Pray and Keith O. Fuglie. *Private Investments in Agricultural Research and International Technology Transfer in Asia* ERS Agricultural Economics Report No. 805. November 2001. <http://www.ers.usda.gov/publications/aer805/>

Robert E. Evenson, Carl E. Pray, and Mark Rosegrant *Agricultural Research and Productivity Growth in India*. Washington: International Food Policy Research Institute. 1999.

Robert E. Evenson and Carl E. Pray. *Research and Productivity in Asian Agriculture*. Ithaca: Cornell University Press, 1991.

Vernon W. Ruttan and Carl E. Pray, eds. *Policy for Agricultural Research*, Boulder and London: Westview Press, 1987.

Refereed Journal Articles

Karmarkar-Deshmukh, R., & Pray, C.E.. Private sector innovation in biofuels in the United States: Induced by prices or policies? *AgBioForum*, 12(1), 141-148. 2009. Available on the World Wide Web: <http://www.agbioforum.org>.

Ruifa Hu, Carl Pray, Jikun Huang, Scott Rozelle, Cunhui Fan, and Caiping Zhang. Reforming Intellectual Property Rights and the Bt Cotton Seed Industry in China: Who Benefits from Policy Reform? *Research Policy* 38, 793–801, 2009.

Wang Zijun, Lin Hai, Huang Jikun, Hu Ruifa, Scott Rozelle and Carl Pray
“Bt Cotton in China: Are Secondary Insect Infestations Offsetting the Benefits in Farmer Fields”
Agricultural Sciences in China January 2009, 8(1): 101-105

Jikun Huang, Ruifa Hu, Scott Rozelle and Carl Pray. “Genetically Modified Rice, Yields and Pesticides: Assessing Farm-level Productivity Effects in China.” *Economic Development and Cultural Change*. 56:241–263, January 2008.

Laurian Unnevehr, Carl Pray, & Robert Paarlberg,. Addressing micronutrient deficiencies: Alternative interventions and technologies. *AgBioForum*, 10(3), 124-134. 2007. Available on the World Wide Web: <http://www.agbioforum.org>.

Carl E. Pray, Robert Paarlberg, & Laurian Unnevehr. Patterns of political response to biofortified varieties of crops produced with different breeding techniques and agronomic traits. *AgBioForum*, 10(3), 135-143. 2007 Available on the World Wide Web: <http://www.agbioforum.org>.

Robert Paarlberg, & Carl E. Pray. Political actors on the landscape. *AgBioForum*, 10(3), 144-153. 2007.n Available on the World Wide Web: <http://www.agbioforum.org>.

Carl E. Pray, & Jikun Huang. Biofortification for China: Political responses to food fortification and GM technology, interest groups, and possible strategies. *AgBioForum*, 10(3), 161-169. 2007. Available on the World Wide Web: <http://www.agbioforum.org>.

Carl E. Pray and Anwar Naseem. “Supplying Crop Biotechnology to the Poor: Opportunities and Constraints.” *Journal of Development Studies* Vol. 43, No. 1, 192–217, January 2007

Jikun Huang, Huanguang Qiu, Junfei Bai, & Carl Pray “Awareness, Acceptance of and Willingness to Buy Genetically Modified Foods in Urban China.” *Appetite* 46 (2006), pp: 144-151

Ruifa Hu, Jie Huang, Carl E. Pray, and Jikun Huang, “The Determinants of Plant Variety Protection Applications in China.” *Journal of Intellectual Property Rights*, Vol, 11, July, 2006. 260-268.

Carl E. Pray, Ramu Govindasamy and Ann Courtmanche (2006) “The Importance of Intellectual Property Rights in the International Spread of Private sector Agricultural Biotechnology.” *The ICFAI Journal of Agricultural Economics*. Vol III, No.3, July 2006, 7-21.

Carl E. Pray, Bharat Ramaswami, Jikun Huang, Prajakta Bengali, Ruifa Hu and Huazhu Zhang (2006) “Costs and Enforcement of Biosafety Regulation in India and China. *International Journal of Technology and Globalization*. Vol.2, Nos.1/2. 2006. 137-157.

Marnus Gouse, Carl Pray, David Schimmelpfennig, & Johann Kirsten. (2006). Three seasons of subsistence insect-resistant maize in South Africa: Have smallholders benefited?. *AgBioForum*, 9(1), 15-22. Available on the World Wide Web: <http://www.agbioforum.org>.

Jie Huang, Ruifa Hu, Carl E. Pray, and Jikun Huang. “Application for Protection of New Plant Variety in China and the Determinant Factors.” (in Chinese) *Chinese Rural Economy*. Vol 5, 2005 (Serial No.245) pp. 47 – 53.

James. F. Oehmke, Carl E. Pray, & Anwar Naseem, “Preface: Innovation and dynamic efficiency in agricultural biotechnology.” *AgBioForum*, 8(2&3), 2005 pp. 50-51. Available on the World Wide Web: <http://www.agbioforum.org>.

Carl E. Pray, James F. Oehmke, & Anwar Naseem, “Innovation and Dynamic Efficiency in Plant Biotechnology: An Introduction to the Researchable Issues.” *AgBioForum*, 8(2&3), 2005. pp. 52-63. Available on the World Wide Web: <http://www.agbioforum.org>.

Margaret Brennan, Carl E Pray, Anwar Naseem, and James F. Oehmke, An Innovation Market Approach to Analyzing Impacts of Mergers and Acquisitions in the Plant Biotechnology Industry *AgBioForum*, 8(2&3), 2005. pp. 89-99. Available on the World Wide Web: <http://www.agbioforum.org>.

Carl E. Pray and Anwar Naseem, Intellectual Property Rights on Research Tools: Incentives or Barriers to Innovation? Case Studies of Rice Genomics and Plant Transformation Technologies *AgBioForum*, 8(2&3), 2005. pp. 108-117. Available on the World Wide Web: <http://www.agbioforum.org>

Carl E. Pray, Prajakta Bengali, and Bharat Ramaswami. “Costs and Benefits of Biosafety Regulation in India: A Preliminary Assessment.” *Quarterly Journal of International Agriculture* 44 (2005), No. 3: 267-289

Jikun Huang, Ruifa Hu, Scott Rozelle, Carl Pray “Insect-Resistant GM Rice in Farmers’ Fields: Assessing Productivity and Health Effects in China.” *Science*. Vol 308 (April 29, 2005) pp 688-690.

Marnus Gouse, Carl E. Pray, Johann Kirsten, David Schimmelpfennig “A GM Subsistence Crop in Africa: The Case of Bt White Maize in South Africa” *International Journal of Biotechnology*. Vol. 7 (1,2,3) 2005. pp.84-94

Marnus Gouse, Carl Pray, and David Schimmelpfennig, “The Distribution of Benefits from Bt Cotton Adoption in South Africa.” *Agbioforum*. 7(4). 2005 pp 187-194

Ferdaus Hossain, Carl E. Pray, Yanmei Lu, Jikun Huang, Cunhui Fan, and Ruifa Hu, “GM Cotton and Farmer’s Health in China: An Econometric Analysis of the Relationship between Pesticide Poisoning and GM Cotton Use in China.” *International Journal of Occupational and Environmental Health*. 10(3) 2004 pp 307-314

David Schimmelpfennig and Carl E. Pray “The Impact of Seed Industry Concentration on Innovation: A Study of U.S. Biotech Market Leaders.” *Agricultural Economics*. Vol. 30(2004) 157-167.

Jikun Huang, Ruifa Hu, Cuihui Fan, Carl E. Pray, and Scott Rozelle. “Bt Cotton Benefits, Costs, and Impacts in China.” *AgBioForum*. Vol.5 (2003) pp 153-166.

Jikun Huang, Ruifa Hu, Carl E. Pray, Fangbin Qiao, Scott Rozelle “Biotechnology as an Alternative to Chemical Pesticides: A Case Study of Bt Cotton in China.” *Agricultural Economics*. Vol. 29 (2003).pp 55-67.

David Gisselquist, Carl Pray, John Nash “Deregulating Technology Transfer In Agriculture: Impact On Technical Change, Productivity, and Incomes.” *World Bank Research Observer*. Vol.17, no.2 (Fall,2002).pp.237-265

Jikun Huang, Ruifa Hu, Scott Rozelle, Fangbin Qiao and Carl E. Pray. “Transgenic Varieties and Productivity of Smallholder Cotton Farmers in China.” *Australian Journal of Agricultural and Resource Economics*. 46:3, (September, 2002).pp.367-387.

Carl E. Pray, Jikun Huang, Ruifa Hu, and Scott Rozelle. “Five Years of Bt Cotton in China - the Benefits Continue.” *The Plant Journal* 31 (4), 2002. pp 423-430.

Jikun Huang, Carl Pray, and Scott Rozelle. “Enhancing the Crops to Feed the Poor.” *Nature* 418 (August 2002) pp. 678-684.

Bharat Ramaswami and Carl E. Pray. “Dissemination of Private Hybrids and Crop Yields in the Semi-Arid Tropics of India.” *Indian Journal of Agricultural Economics*. 57 (1) 2002. pp. 39-51.

Jikun Huang, Scott Roselle, Carl E. Pray, and Qinfang Wang. "Plant Biotechnology in China" *Science* Vol.295.(25 January 2002). pp 674-677.

Bharat Ramaswami, Carl E. Pray, and Tim Kelley. “The Impact of Economic Reforms on R&D by the Indian Seed Industry.” *Food Policy* 26 (6) 2001.pp. 587-598.

Carl E. Pray. "Public/Private Sector Linkages in Research and Development: Biotechnology and the Seed Industry in Brazil, China and India." *American Journal of Agricultural Economics*. 83(3) August 2001.pp 742-747.

Carl E. Pray and Bharat Ramaswami. "Technology, IPRs, and Reform Options: A Case Study of the Seed Industry with Implications for Other Input Industries." *The International Food and Agricultural Marketing Review* Special Issue.Vol. 2 (3/4) 2001. pp. 407-420.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao "Impact of Bt Cotton in China" *World Development* Vol.29, No.5, pp.813-825, 2001.

Carl E. Pray."Public and Private Collaboration on Plant Biotechnology In China." *AgBioForum* Volume 2, Winter 1999. <http://www.agbioforum.missouri.edu>.

Carl E. Pray and Dina Umali-Deininger. "Private Agricultural Research: Will It Fill the Gap?" *World Development*, Vol.26. No.6.1998. 1127-1148.

Scott Rozelle, Carl E. Pray and Huang Jikun. "Agricultural Research Policy in China: Testing the Limits of Commercialization-led Reform." *Comparative Economic Studies*, Vol.39. No.2.Summer, 1997. 37-71.

Carl E. Pray and Jock Anderson. "The Agricultural Research System of the Former Soviet Union: Past and Future." *Journal of International Development*, Vol.9. 1997.pp. 517-527

C. Ramasamy, T. R. Shanmugam, and Carl Pray. "Priority Setting for Rice Research in Southern India - An Ex-Ante Approach." *Indian Journal of Agricultural Economics*, Vol 52. No. 1. January-March, 1997.

Hu Ruifa, Huang Jikun, Carl Pray, and Scott Rozelle. "Problems in the Current Chinese Agricultural Research System" (in Chinese) in *Management World*, No. 3, 1996. pp. 167-183.

Carl E. Pray. "Impact of Privatization of Agricultural Research in Great Britain: An Interim Report." *Food Policy*, Vol.21, No.3, 1996.pp. 305-318.

Michael Westendorf, R. G. Zimbelman, and C. E. Pray. "Science and Agriculture Policy at Land-Grant Institutions." *Journal of Animal Science*, Vol. 73 (1995) pp. 1628-1638.

Carl E. Pray and Robert E. Evenson. "Measuring Food Production (with reference to South Asia)." *Journal of Development Economics*, Vol.44. 1994. pp.173-197.

Carl E. Pray and Mary Knudson. "Impact of Intellectual Property Rights on Genetic Diversity: The Case of U.S. Wheat." *Contemporary Economic Policy. A Journal of the Western Economic Association International*. Vol.12. 1994.pp.102-112.

Carl E. Pray, Sharmila Ribeiro, Rolf A. E. Mueller and P. Parthasarathy Rao. "Private Research and Public Benefit: The Private Seed Industry for Sorghum and Pearl Millet in India." *Research Policy*, Vol. 20 (1991). pp.315-324.

Carl E. Pray and Mary Knudson. "Plant Variety Protection, Private Funding and Public Sector Research Priorities." *American Journal of Agricultural Economics*, Vol.73, No.3. 1991. pp.882-886.

Carl E. Pray. "The Potential Impact of Liberalizing Indian Seed Policy." *Food Policy*, Vol.15. July, 1990. pp 193-198.

Carl E. Pray and Catherine F. Neumeyer. "Trends and Composition of Private Food and Agricultural Research in the United States." *Agribusiness: An International Journal*, Summer, 1990.

Carl E. Pray and Ruben Echeverria. "Transferring Hybrid Maize Technology: The Role of the Private Sector." *Food Policy*, November, 1988. pp. 366-374.

Carl E. Pray. "Mobilizing Support for Agricultural Research: A Case Study of the University of Minnesota." *Agricultural Administration*, Summer, 1988. pp. 165-180.

R. E. Evenson, Carl E. Pray and Grant Scobie. "The Influence of International Research on the Size of National Research Systems." *American Journal of Agricultural Economics*, December, 1985. pp. 1074-1079.

Carl E. Pray. "Accuracy of Official Statistics and the Sources of Agricultural Growth in the Punjab 1907-1947." *Indian Economic and Social History Review*, Vol. 21, No. 3, 1984. pp. 313-334.

Carl E. Pray. "The Impact of Agricultural Research in British India." *The Journal of Economic History*, Vol. XLIX, No. 2, June, 1984. pp. 429-440.

Carl E. Pray. "Underinvestment and the Demand for Agricultural Research: A Case Study of the Punjab." *Food Research Institute Studies*, Vol. XIX, No. 1, 1983. pp. 51-80. Reprinted in Japanese in *Nobiyuku Nogyo* (Growing Agriculture) in 1984. pp. 1-32.

Carl E. Pray. "Private Agricultural Research in Asia." *Food Policy*, Vol. 8, No. 2, May, 1983. pp. 131-140.

Carl E. Pray. "The Green Revolution: An Appraisal." *Economic Impact*, No. 39, 1982. pp. 26-33.

Carl E. Pray. "The Green Revolution as a Case Study in the Transfer of Technology." *The Annals of the American Academy of Political and Social Sciences*, Vol 458. November, 1981. pp. 68-80.

Carl E. Pray. "A Review of the Accuracy of the Official Agricultural Output and Input Statistics of Bangladesh." *Bangladesh Development Studies*, Vol. VIII, Nos. 1 and 2, Winter-Summer, 1980. pp. 1-38.

Carl E. Pray. "The Economics of Agricultural Research in British Punjab and Pakistani Punjab 1905-1975." *Journal of Economic History*, Vol. XL, No. 1, March, 1980. pp. 174-176.

Carl E. Pray. "The Economics of Agricultural Research in Bangladesh." *The Bangladesh Journal of Agricultural Economics*, December, 1979. pp. 1-34.

Book Chapters

Nienke Beintema, Ali Koc, Ponniah Anandajayasekeram, Aida Isinika, Frances Kimmins, Workneh Negatu, Diane Osgood, Carl Pray, Marta Rivera-Ferre, V. Santhakumar, and Hermann Waibel (2009) "Chapter Agricultural Knowledge, Science And Technology: Investment And Economic Returns." In B.D.McIntyre, H.R.Herren, J.Wakhungu, and R.T.Watson (eds.) *International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). Global Report*. Island Press: Washington DC. 2009

Matin Qaim, Carl E. Pray, and David Zilberman "Economic And Social Considerations In The Adoption Of *Bt* Crops." in J. Romeis, A. M. Shelton, and G. G. Kennedy (eds) *Integration of Insect-resistant GM crops within IPM Programs* Springer 2008.

Carl E. Pray, Dan Johnson, and Keith Fuglie. "Private Sector Research" Chapter 49 in R.Evenson and P. Pingali (eds) *Handbook of Agricultural Economics*. Amsterdam (Netherlands), Elsevier/North Holland Volume 3 2007.

Jikun Huang, Ruifa Hu, Scott Rozelle, and Carl Pray, "China: Emerging Public Sector Model for GM Crop Development" in S.Fukuda-Parr ed. *The Gene Revolution: GM Crops and Unequal Development* Earthscan: London, 2007.

Bharat Ramaswami and Carl E. Pray. "India: Confronting the Challenge – the Potential of Genetically Modified Crops for the Poor." In S.Fukuda-Parr ed. *The Gene Revolution: GM Crops and Unequal Development* Earthscan: London, 2007.

Carl E. Pray, Jikun Huang, Ruifa Hu, Qihuai Wang, Bharat Ramaswami, and Prajakta Bengali "Benefits And Costs Of Biosafety Regulation in India and China" in R.E. Just, J.M. Alston, D. Zilberman (Eds.) *Regulating Agricultural Biotechnology: Economics and Policy* Springer: New York, 2006.

Jikun Huang, Ruifa Hu, Cunhui Fan, Carl Pray, Scott Rozelle. "Economic Impacts of *Bt* Cotton in China." in Jia Shirong ed. *Transgenic Cotton*. Science Press, Beijing/New York. 2004

C. Klotz-Ingram, Schimmelpfennig, D., Naseem, A., King, J. and Pray, C (2004) "How Firm Characteristics Influence Innovative Activity in Agricultural Biotechnology" In R.E. Evenson and V. Santaniello, eds., *The Governance of Agricultural Biotechnology* CABI Publishing, 2004

Anwar Naseem and Carl E. Pray. "Economic Impact Analysis of Genetically Modified Crops" Chapter for the *Handbook of Plant Biotechnology* (P. Christou and H. Klee, eds) *Section I: Risk Assessment of Transgenic Crops and Public Policy Issues* John Wiley and Sons, London. 2003.

Carl E. Pray and Jikun Huang, "The Impact of Biotechnology on Incomes and Pesticide Use in China." N. Kalaitzandonakes (ed) *Economic and Environmental Impacts of First Generation Biotechnologies*. Kluwer. 2003.

Eduardo J. Trigo, Greg Traxler, Carl Pray, and Ruben Echeverría "Agricultural Biotechnology in Latin America and the Caribbean." In P.G.Pardey (ed) *The Future of Food: Biotechnology Markets and Policies in an International Setting*. IFPRI: Washington DC 2002.

Carl E. Pray. "The Growing Role of the Private Sector in Agricultural Research." In R. Echeverria and D. Byerlee (eds). *Agricultural Research Policy In An Era Of Privatization* CABI. Cambridge. U.K. 2002.

Jikun Huang, Ruifa Hu, Carl Pray, Scott Rozelle. "Re-Reforming China's Agricultural Research System." In R. Echeverria and D. Byerlee (eds). *Agricultural Research Policy In An Era Of Privatization* CABI. Cambridge. U.K. 2002.

Carl E. Pray and Keith Fuglie. "Policies for Private Agricultural Research in Asian LDCs" *The Proceedings of the International Association of Agricultural Economics Meetings* Berlin, Germany. 2001

Carl E. Pray and Keith Fuglie. "The Private Sector and International Agricultural Technology Transfer." In Keith Fuglie and David Schimmelpfennig (eds.) *Public-Private Collaboration in Agricultural Research: New Institutional Arrangements and Economic Implications*. Ames: Iowa State University Press, 2000.

Margaret Brennan, Carl E. Pray, and Ann Courtmanche. "Impact of Industry Concentration on Innovation in the US Plant Biotech Industry." In W.H. Lesser (Ed.), *Transitions in Agbiotech: Economics of Strategy and Policy*. Storrs, CT: Food Marketing Policy Center, University of Connecticut. 2000.

Carl E. Pray. "Impact of Biotechnology on the Demand for Rice Biodiversity" in R. E. Evenson, D. Gollin, and V. Santaniello (eds.) *Economic Policy for Genetic Resources*., London: CAB International. 1998. Pp. 249-259.

Carl E. Pray and Rob Tripp. "Industrial Policy Issues: Participation, Prices and Property Rights." in M. Morris (ed.) *Maize Seed Industries in Developing Countries*. Boulder: Lynne Reiner Press, 1998. Pp.175-189.

Carl E. Pray, Scott Rozelle and Huang Jikun. "China." in M. Morris (ed.) *Maize Seed Industries in Developing Countries*. Boulder: Lynne Reiner Press, 1998. Pp.335-351.

Carl E. Pray. "Country Case Study: Turkey." in M. Morris (ed.) *Maize Seed Industries in Developing Countries*. Boulder: Lynne Reiner Press, 1998. Pp.321-334.

Carl E. Pray. "Private Funding for Public Research." in S. R. Tabor, H. Bruneau, and W. Janssen (eds.) *Financing Agricultural Research : A Sourcebook*. The Hague: International Service for National Agricultural Research. 1998.pp. 205-227.

Hu Ruifa, Huang Jikun, Carl Pray, and Scott Rozelle. "Problems in the Current Chinese Agricultural Research System." (in Chinese) in *Technology Management and Achievement*, Beijing: China People's University Press. 1996. pp. 52-57. (Reprint of *Management World*, 1996 article).

Clare Narrod and Carl Pray. "Technology Transfer in the Poultry Industry: Factors and Externalities Associated with Increased Production." in K. Steely, (ed.) *Animal Waste and the Land-Water Interface*. Boca Raton, FL:CRS Press, 1995. pp 523-532.

Carl E. Pray. "Private Sector Rice Research: Implications for Public Sector Priority Setting." in M. Mukherjee (ed.) *Hybrid Rice in India*. Madras, India: MacMillan India, 1993.

Carl E. Pray and Bharat Ramaswami. "A Framework for Seed Policy Analysis in Developing Countries." in J.Abbott (ed) *Agricultural and Food Marketing in Developing Countries: Selected Readings*. Oxford: CAB International, 1993.

Carl E. Pray. "Trends in U.S. Food and Agricultural R&D: Signs of Declining Competitiveness?" in Robert Weaver (ed.) *U.S. Agricultural Research: Challenges and Options*. Washington DC: Agricultural Research Institute, 1993. pp. 51-67.

Carl E. Pray. "Plant Breeders' Rights Legislation, Enforcement and R&D: Lessons for Developing Countries." in *Sustainable Agricultural Development: The Role of International Cooperation*, Vermont: Dartmouth Publishing, 1992.

Carl E. Pray. "Trends in R&D Productivity and Expenditures and Implications for State Agricultural Experiment Stations." in *The Economic Impacts of Agricultural Research: A Workshop Sponsored by the Agricultural Research Institute*, Washington DC: Agricultural Research Institute, 1991.

Carl E. Pray and Robert Evenson. "Lessons for Future Agricultural Development in Asia." in Evenson, Pray and others, *Research and Productivity in Asian Agriculture*. Ithaca: Cornell University Press, 1991.

Carl E. Pray. "The Development of Asian Research Institutions: Underinvestment, Allocation of Resources and Productivity." in Evenson, Pray and others, *Research and Productivity in Asian Agriculture*. Ithaca: Cornell University Press, 1991. pp.47-80.

Carl E. Pray and Zafar Ahmed. "Agricultural Productivity and Research in Bangladesh." in Evenson, Pray and others, *Research, Productivity in Asian Agriculture*. Ithaca: Cornell University Press, 1991. pp.114-132.

Carl E. Pray and Ruben G. Echeverria. "Determinants and Scope of Private Sector Agricultural Research in Developing Countries." in Philip Pardey, Johannes Roseboom and Jock R. Anderson, (eds.) *Agricultural Research Policy: International Quantitative Perspectives*. Cambridge: Cambridge University Press, 1991. pp. 343-364.

Carl E. Pray and Catherine F. Neumeyer. "Problems of Omitting Private Investments in Research When Measuring the Impact of Public Research." in *Research Methods for Diagnosing Research System Constraints and Assessing the Impact of Agricultural Research, Vol II, Assessing the Impact of Agricultural Research*. The Hague: ISNAR, 1990.

Carl E. Pray and Vernon W. Ruttan. "Science and Technology Policy: Lessons from the Agricultural Sector in South and Southeast Asia." in Robert Evenson and Gustav Ranis (eds.) *Science and Technology Policy: Lessons for Development*. Boulder: Westview Press, 1990. pp. 179-207.

Carl E. Pray and Ruben Echeverria. "Private Sector Agricultural Research and Technology Transfer Links in Developing Countries." in David Kaimowitz (ed.) *Making the Link: Agricultural Research and Technology Transfer in Developing Countries*. Boulder: Westview Press, 1990.

Carl E. Pray. "Private Sector Research and Technology Transfer in Asia." in Ruttan and Pray (eds.) *Policy for Agricultural Research*. Boulder and London: Westview Press, 1987. pp. 411-432.

Richard I. Sauer and Carl E. Pray. "Mobilizing Support for Agricultural Research at the Minnesota Agricultural Experiment Station." in Ruttan and Pray (eds.) *Policy for Agricultural Research*. Boulder and London: Westview Press, 1987. pp. 211-234.

Carl E. Pray. "Mobilizing Political Support for Agricultural Research." in Vernon W. Ruttan, *Agricultural Research Policy and Development*. Rome: FAO, 1987. pp. 127-142.

Carl E. Pray. "Agricultural Research in Foodgrains and Nonfood-grains Asia: The Colonial Heritage." in Bruce Greenshields and Margot Bellamy (eds.) *Rural Development: Growth and Inequity*. Aldershot, England: Gower Publishing, 1983. pp. 250-256.

CONFERENCE PRESENTATIONS, LECTURES, DEMONSTRATIONS

International presentations:

Carl E. Pray, "Bt Maize, Mycotoxins, Cancer and Birth Defects: Some preliminary evidence from South Africa." International Association of Agricultural Economists, Beijing, China, August 17, 2009

Carl E. Pray "The Emerging Bioeconomy: International Consortium of Agricultural Biotechnology Research (ICABR) 2009." International Consortium on Agricultural Biotechnology Research (ICABR) conference on *The Emerging Bioeconomy*. Ravello (Italy), June 18-20, 2009.

Carl E. Pray "Bt Maize, Mycotoxins, Cancer and Birth Defects: Some preliminary evidence from South Africa." International Conference on Agricultural Biotechnology Research for Africa. Entebbe, Uganda. May 19-21, 2009

Carl E. Pray "The Economics of Innovation in the Indian Seed/Biotech Sector." Presented at Tamil Nadu Agricultural University, November 16, 2008.

Carl E. Pray "Private Sector Innovation in Biofuels in the United States: Induced by Prices or Policies." International Consortium on Agricultural Biotechnology Research (ICABR) conference on *The Future of Agricultural Biotechnology: Creative Destruction, Adoption, or Irrelevance?* Ravello (Italy), June 12-14, 2008

Carl E. Pray "Globalization of Private Agricultural Research and Innovation: Opportunities for Developing Countries?" Advancing Agriculture in Developing Countries through Knowledge and Innovation, International Conference, April 7-9, 2008, Addis Ababa, Ethiopia

Carl E. Pray "The Economics of Innovation in the Indian Seed/Biotech Sector." Indian Institute of Management (Ahmedabad). January 4, 2008.

Carl E. Pray organized with Laurian Unnevehr a roundtable discussion on "What are the prospects for GM crops to contribute to better nutrition in LDCs?" and presented the China case in this roundtable at the International Consortium on Agricultural Biotechnology Research (ICABR) conference on *Agricultural Biotechnologies: New Frontiers and Products – Economics, Policies and Science* Ravello (Italy), July 26 - 29, 2007

Carl E. Pray "Bt Maize and Fumonisin Reduction in South Africa: Potential Health Impacts" presented at the International Consortium on Agricultural Biotechnology Research (ICABR)

conference on *Agricultural Biotechnologies: New Frontiers and Products – Economics, Policies and Science* Ravello (Italy), July 26 - 29, 2007

Carl Pray organized a workshop for agricultural economists from China, India, Thailand, the United Kingdom, United States on “Measuring the Impact of Drought Tolerant Rice Varieties in Asia” in Bangkok, Thailand, March 17 and 18, 2007 and made two presentations: “Water Shortages and New Rice Varieties in China” and “China project to measure the impact of Drought Tolerant Rice”

Carl E. Pray. “Ten Years of Transgenic Crops: Impacts on LDCs” at the Applied Economics Laboratory of the National Agricultural Research Institute (INRA) Grenoble, France, November 30, 2006 and at the Industrial Organization Laboratory of INRA in Paris, December 4, 2006.

Carl E. Pray. “GM Crops: Economic Benefits and Environmental Impact” GRDC/Crawford Fund Canberra Conference, Canberra Australia, August 21, 2006.

Carl E. Pray “Anti-Commons – Is it a problem in LDCs? If so, what can be done?” Symposium at the 26th Triennial International Association of Agricultural Economists (IAAE) August 12 – 18, 2006

Carl E. Pray “The Adoption of Bt Cotton in China” Symposium at the 26th Triennial International Association of Agricultural Economists (IAAE) August 12 – 18, 2006.

Carl E. Pray “Is Biotechnology and Seed Regulation an Obstacle to Agricultural Development in Sub-Saharan Africa?” Symposium at the 26th Triennial International Association of Agricultural Economists (IAAE) August 12 – 18, 2006.

Ruifa Hu, Jikun Huang, Hai Lin, Scott Rozelle, and Carl Pray. “Bt Cotton in China: Are Secondary Insect Infestations Offsetting the Benefits in Farmer Fields?” International Consortium on Agricultural Biotechnology Research (ICABR) *Agricultural Biotechnology: Facts, Analysis, and Policies*. Ravello (Italy), June 29-July 2, 2006

Ruifa Hu, Jikun Huang, Hai Lin, Scott Rozelle, and Carl Pray. “Eight Years of *Bt* Cotton in Farmer Fields in China: Has the Bollworm Population Developed Resistance?” International Consortium on Agricultural Biotechnology Research (ICABR) *Agricultural Biotechnology: Facts, Analysis, and Policies*. Ravello (Italy), June 29-July 2, 2006

Carl E. Pray “Public-Private Research Partnerships for Seed Sector Development” CWANA International Seed Trade Conference, 29 November to 1 December 2005 Antalya, Turkey

Carl E. Pray “Biotechnology: International Diffusion, Recent Findings, and Opportunities for China.” 10th Anniversary Celebration Seminar of the Center for Chinese Agricultural Policy, Chinese Academy of Science, Beijing, September 26, 2005.

Carl E. Pray and Marnus Gouse, "Can Bt maize improve the well being of small farmers in South Africa?" Medical Research Council of South Africa, Tygerberg, South Africa, August 17, 2005

Carl E. Pray, "Impact of Bt Food grain on Small Farmers in China and South Africa." Microbiology Department, University of Capetown, Capetown, South Africa, August 15, 2005

Carl E. Pray and Anwar Naseem. "Intellectual Property Rights And Research Tools - Incentives On Barriers To Innovation?: Case Studies of Rice Genomics and Plant Transformation Technologies" International Consortium on Agricultural Biotechnology Research (ICABR) *Agricultural Biotechnology: Ten Years After Ravello* (Italy), July 6 - 10, 2005

Carl E. Pray "The Impact of Molecular Markers and Marker Assisted Breeding On Asian Research Systems and on Farmers: A Case Study of the Asian Maize Biotechnology Network" International Consortium on Agricultural Biotechnology Research (ICABR) *Agricultural Biotechnology: Ten Years After Ravello* (Italy), July 6 - 10, 2005

Carl E. Pray. "Defining the problem and solution models" Seminar on Making GM crops work for human development: socio-economic issues and institutional challenges. Rockefeller Conference Center, Bellagio, Italy. June 3, 2005.

Carl E. Pray. "Will Private Agricultural Research be a Major Engine of Agricultural Productivity Growth in China?" presented at the Center for Chinese Agricultural Policy, Chinese Academy of Science, Beijing, November 16, 2004.

Carl E. Pray. "The economic and health impact of biotech crops on poor farmers in developing countries" *Feeding a Hungry World: The Moral Imperative of Biotechnology* The Pontifical Gregorian University, Rome, Italy, September 24, 2004

Carl E. Pray. "Impact Assessment of AMBIONET: Initial Impressions." International Maize and Wheat Research Center, Texcoco, Mexico. August 5, 2004

Marnus Gouse, Carl Pray, Johann Kirsten, and David Schimmelpfennig "Impact of Bt White Maize on Small-scale Farmers in South Africa." International Consortium on Agricultural Biotechnology Research (ICABR) 8th ICABR International Conference on Agricultural Biotechnology: International Trade and Domestic Production Ravello (Italy), July 8 - 11, 2004

Carl E. Pray, Prajakta Bengali, and Bharat Ramaswami. "Costs and Benefits of Biosafety Regulation in India: A Preliminary Assessment." International Consortium on Agricultural Biotechnology Research (ICABR) 8th ICABR International Conference On Agricultural Biotechnology: International Trade and Domestic Production Ravello (Italy), July 8 - 11, 2004

Carl E. Pray "Economic impacts of transgenic crops in developing countries" Agricultural biotechnology for economic development: ESA/FAO – ICABR roundtable, Food and Agriculture Organization of the United Nations , Rome, July 7, 2004.

Carl E. Pray. "Biosafety Regulations, Research & the Spread of GM Crops in India." Inaugural Lecture of the Annual University of Reading Biotechnology, Economics, and Society Center. April 5, 2004.

Carl E. Pray, "Biotech and Seed Industry Policies in China: Who Could Benefit from Policy Reform?" Invited paper at the Agricultural Economics Society Annual Conference, Imperial College, London, U.K., April 4, 2004

Carl E. Pray, "International Experience in Public-Private Partnerships in Agricultural R&D" The 2nd Expert Meeting of Agricultural and Rural Development Task Force, China Council for International Cooperation on Environment and Development (CCICED) Beijing, China 18-20 March 2004

Carl E. Pray. "Agricultural Biotechnology in China: the Case of Bt Cotton." Workshop on Agricultural Biotechnology in Developing Countries: Perception, Politics, and Policies at ETH Zurich, Switzerland, March 12, 2004.

Carl E. Pray, "Commentary on Public-Private Partnerships in Agricultural Research: An Analysis of Risks and Rewards to Industry and the CGIAR." At the conference Cooperation in Agricultural Research: A Review of Research on Public-Private Partnerships. Frankfurt, Germany. February 26, 2004

Carl E. Pray. "Measuring the impact of AMBIONET". Annual Meeting of the Asian Maize Biotechnology Network, Chiang Mai, Thailand, October 6, 2003.

Carl E. Pray "Beyond basic research: obstacles to delivery and accessibility to biotechnology: the Cases of China and Southern and Eastern Africa" International Agricultural Economists Association meetings Durban, South Africa. August 16-22, 2003.

Marnus Gouse and Carl E. Pray "GM Crops and Income Distribution in South Africa" International Agricultural Economists Association meetings Durban, South Africa. August 16-22, 2003.

Carl E. Pray. "Public/private research - policy options to enhance pro-poor research." 7th ICABR Conference on "*Public Goods and Public Policy for Agricultural Biotechnology*". Ravello (Italy), June 29 - July 3, 2003.

Carl E. Pray and Anwar Naseem. "Economic Impact Analysis of GMOs: Implications for Food Crops in Developing Countries" Presented at the Workshop on Biosafety of Transgenic Rice, Chennai, India. October 27 to 30, 2002.

Carl E. Pray. "Changing Roles of Public and Private Sectors in Agricultural Research and the Implications for Agricultural Productivity." Invited speaker at plenary session. International Rice Research Conference of the International Rice Congress 2002 Beijing, China. September 16-20, 2002

Carl E. Pray. "Changing Roles of Public and Private Sectors in Agricultural Research in China." At the Institute of Agricultural Economics, Chinese Academy of Agricultural Sciences." Beijing, China. September 20, 2002.

Carl E. Pray. "Impact of biotechnology on small farmers in China and implications for Africa." University of Capetown, Capetown, South Africa. August 12, 2002.

Carl E. Pray "An Econometric Analysis of the Reduction in Pesticide Poisoning Due to Bt Cotton Use in China." Presented at 6th International Conference convened by ICABR (International Consortium on Agricultural Biotechnology Research) on Agricultural Biotechnologies: New Avenues for Production, Consumption and Technology Transfer. Ravello (Italy), from July 11 to 14, 2002

Carl E. Pray "Five Years of Bt Cotton in China – The Benefits Continue" Presented at 6th International Conference convened by ICABR (International Consortium on Agricultural Biotechnology Research) on Agricultural Biotechnologies: New Avenues for Production, Consumption and Technology Transfer. Ravello (Italy), from July 11 to 14, 2002

Carl E. Pray, Ann Courtmanche, and Ramu Govindasamy. "The Importance of Intellectual Property Rights in the International Spread of Private Sector Agricultural Biotechnology." Presented at 6th International Conference convened by ICABR on Agricultural Biotechnologies: New Avenues for Production, Consumption and Technology Transfer. Ravello (Italy), from July 11 to 14, 2002

Carl E. Pray. "Economics of Agricultural Biotechnology." U.S. State Department financed lecture tour of Bangladesh and China in June, 2002. Presented Lectures at the University of Dhaka and Army War College and met with officials at the Ministry of Planning and Ministry of Agriculture in Dhaka, Bangladesh. Presented Lectures at the U.S. Information Service Office, the Chinese Environmental Protection Agency, Remin University, and the Chinese Academy of Social Sciences in Beijing, China.

Carl E. Pray and David Schimmelpfennig. "The Impact of Biotechnology on South African Agriculture: First Impressions." College of Agriculture Seminar. U. of Pretoria. South Africa. August 28, 2001.

Jikun Huang, Ruifa Hu, Carl E. Pray, Fangbin Qiao, Scott Rozelle."Biotechnology as an Alternative to Chemical Pesticides: A Case Study of Bt Cotton in China." Presented at 5th International Conference convened by ICABR (International Consortium on Agricultural Biotechnology Research) on: "Biotechnology, Science and Modern Agriculture: a New Industry at the Dawn of the Century." Ravello (Italy) June 15-18, 2001.

Carl E. Pray. Discussion of Asian Development Bank Report on Agricultural Biotechnology in Asia. Asian Development Bank. Manila, Philippines. January 19, 2001.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao “Impact of Bt Cotton in China.” 4th International Conference on the Economics of Agricultural Biotechnology Ravello (Italy), from August 24 to 28, 2000

David Schimmelpfennig, Carl Pray, and Ann Courtmanche. “Concentration, Regulation, and Maize Biotech Research: An International Perspective.” 4th International Conference on the “Economics of Agricultural Biotechnology” Ravello (Italy), from August 24 to 28, 2000

Carl E. Pray and Keith Fuglie. “Policies for Private Agricultural Research in Asian LDCs” International Association of Agricultural Economics, Berlin, Germany, August 13 to 18, 2000.

Jikun Huang, Ruifa Hu, Carl Pray, Scott Rozelle. “Re-Reforming China’s Agricultural Research System.” International Association of Agricultural Economics, Berlin, Germany, August 13 to 18, 2000.

Carl E. Pray. “Biotechnology In China – Do IPRs need to be Strengthened?” International Association of Agricultural Economics, Berlin, Germany, August 13 to 18, 2000.

David Schimmelpfennig, Carl Pray, and Margaret Brennan. “Market Structure and Innovation Intensity In Agricultural Biotech.” International Association of Agricultural Economics, Berlin, Germany, August 13 to 18, 2000.

Clare Narrod and Carl E. Pray. “Technology, Policies, and the Global Poultry Revolution.” International Association of Agricultural Economics, Berlin, Germany, August 13 to 18, 2000.

Carl E. Pray. “Private Plant Biotech Research In North American and Europe :Implications For Latin American.” Presentation at the InterAmerican Development Bank. Washington. DC. June 16, 2000.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao “Impact of Bt Cotton in China.” National Center for Agricultural Policy, Indian Council of Agricultural Research, New Delhi, India. May 29, 2000.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao “Impact of Bt Cotton in China” Presented at a symposium on Genetically Modified Organisms & Smallholders in the Developing World, Agricultural Economics Society Annual Conference, Hulme Hall, University of Manchester, 15th April 2000

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao “Impact of Bt Cotton in China” presented at the John Innes Centre, Norwich, U.K. April 10, 2000.

Ann Courtmanche, Carl E. Pray, and Margaret Brennan, “The Importance of Policies and Regulations in the International Spread of Agricultural Biotechnology.” At Conference on the Shape of the Coming Agricultural Biotechnology Transformation: Strategic Investment and Policy Approaches from an Economic Perspective. Rome, Italy. June 17-19, 1999.

Carl E. Pray. "Technology, IPRs, and Reform Options: A Case Study of the Seed Industry with Implications for Other Input Industries." Presented at NCAER-IEG-World Bank Workshop on Reforms in Indian Agriculture for Growth, Efficiency, Equity and Sustainability. New Delhi, India. April 15 & 16, 1999

Carl E. Pray and David Gisselquist. "Regulatory Framework for Private Technology Transfer" Presented at the World Bank, Agricultural Knowledge and Information Systems (AKIS) Thematic Group Second Annual Retreat, March 23-24, 1999, Airlie Center, Warrenton, Virginia

Carl E. Pray. "The Scope and Mechanisms for Private Funding of Agricultural Research." Presented at the Expert Consultation on Agricultural Research Systems in Central Asia and the Caucasus. June 3-5, 1998. ISNAR, The Hague, The Netherlands.

Carl E. Pray. "Liberalization, Private Plant Breeding and Farmers' Yields in the Semi-Arid Tropics of India." World Bank. April 28, 1998

Carl E. Pray. "Agricultural Biotechnology in Asia: A Progress Report." Paper to be presented at an invited panel on Economic Issues of Biotechnology in Agriculture at the International Conference of Agricultural Economists. Sacramento, California. August, 1997.

Carl E. Pray and Dina Umali-Deininger. "Private Agricultural Research: Will It Fill the Gap?" Paper to be presented at the International Conference of Agricultural Economists. Sacramento, California. August, 1997.

Carl E. Pray and Keith Fuglie. "Private Food and Agricultural Research and Public Policy in APEC Countries." Paper presented at the Asia-Pacific Economic Cooperation (APEC) Conference on Food and Agriculture Challenges in the Asia-Pacific. Manila, Philippines. October 1-3, 1996.

Carl E. Pray, Scott Rozelle, and Huang Jikun. "Incomplete Commercialization of the Chinese Seed Industry: The Need for Further Reform." Paper presented at the Global Agricultural Science Policy for the Twenty-first Century conference. Melbourne, Australia. August 29, 1996.

Carl E. Pray. "Turkey: Transferring Hybrid Maize through Multinational Corporations." Paper presented at the Workshop on Maize Seed Industry. CIMMYT, Mexico, April 25-27, 1996.

Carl E. Pray and Rob Tripp. "Policies that Influence Seed Industry Development: Industrial Structure, Seed Prices and Intellectual Property Rights." Paper presented at the Workshop on Maize Seed Industry. CIMMYT, Mexico, April 25-27, 1996.

Rob Tripp and Carl E. Pray. "Regulation and Industrial Policy for the Seed Industry." Paper presented at the Workshop on Maize Seed Industry. CIMMYT, Mexico, April 25-27, 1996.

Carl E. Pray. "Impact of Biotechnology on the Demand for Rice Biodiversity." Paper presented at FAO Symposium on Economic Policy for Genetic Resources. Universita 'degli Studi di Roma "Tor Vergata", Rome, May 13-15, 1996.

Carl E. Pray. "Incomplete Reform, Exaggerated Promises, and Improvements in the Supply of Private Goods: Some Lessons for Africa from Seed Industry Reform in Turkey and India." Paper presented at the Economic Development Institute, The World Bank. Washington, D. C. December 7, 1995.

Carl E. Pray, Scott Rozelle, and Huang Jikun "Research Reform in China." Paper presented at The World Bank. Washington, D.C. August 7, 1995.

Carl E. Pray. "Policy and Regulatory Reforms and Private Sector Development: Case Studies of Seed Industries in India and Turkey." Paper presented at The World Bank. Washington, D.C. June 29, 1995.

Carl E. Pray. "Rice Biotechnology Research in India: Costs, Benefits and Institutions." Paper presented at Seventh Annual Meeting of the International Program on Rice Biotechnology. Indonesia, May, 1994.

David Gisselquist and Carl E. Pray. "Barriers to the International Transfer of Agricultural Technology." Paper presented at Division Seminar, Trade Policy Division, The World Bank. Washington, D.C. April, 1994.

Carl E. Pray. "Potential for International Collaboration in Rice Biotechnology." Paper presented at Rice Research Prioritization Workshop at International Rice Research Institute. Los Banos, Philippines. February, 1994.

Carl E. Pray. "Privatization of Food and Agricultural Research: An International Perspective." Paper presented at the International Maize and Wheat Research Center. Mexico, December 1993.

Carl E. Pray and Vasumati Parthasarathy. "Cost of Rice Biotechnology Research in India." Paper presented at the Rockefeller Foundation Rice Biotechnology Network Meeting. Chiang Mai, Thailand. February 1993.

Carl E. Pray. "Private Sector Rice Research: Implications for Public Sector Priority Setting in India." Paper presented at Conference on Hybrid Rice in India. Bombay, India. August 14, 1992.

Carl E. Pray. "Private Sector Rice Research: Implications for Public Sector Priority Setting." Paper presented at International Rice Research Institute. Los Banos, Philippines. August 1991.

Carl E. Pray. "Private Sector Research in Asia." Paper presented at the PROAGRO/ISNAR Conference. The Hague, Netherlands. April 1985.

Carl E. Pray. "The United States Seed Industry." Paper presented at the PROAGRO/ISNAR Conference. Buenos Aires, Argentina. August 1984.

Presentations in the U.S.A.

Ruifa Hu, Carl Pray, Jikun Huang, Scott Rozelle, Cunhui Fan, and Caiping Zhang. "Reforming intellectual property rights and the Bt cotton seed industry in China: Who benefits from policy reform?" American Agricultural Economics Association annual meetings, Milwaukee. July 27, 2009

Carl E. Pray. "Bt Maize, Mycotoxins, Cancer and Birth Defects: Some preliminary evidence from South Africa." American Agricultural Economics Association annual meetings, Milwaukee. July 27, 2009

Carl E. Pray "Economic and Health Impacts of GM Crops in Asia and Sub-Saharan Africa" Conference on Bioeconomy: Food, Energy and the Environment. U. of California, Berkeley. July 1, 2009

Carl E. Pray. "Economic and health impacts of GM crops on China, India and South Africa." Conference on Feeding a Hot and Hungry Planet: The Challenge of Making More Food and Few Greenhouse Gases. Princeton University, April 29 – May 1, 2009.

Carl E. Pray and Jikun Huang "GM Food and Feed in China: Will Chinese Production of GM Rice and Corn be Allowed?" at the Biotechnology in Developing Countries Conference University of California, Berkeley Alumni House, Jan. 23-24, 2009

Bharat Ramaswami and Carl Pray, Rutgers University National Laws, Provincial Enforcement: Biosafety, Intellectual Property Rights and Seed Price Controls in India. at the Biotechnology in Developing Countries Conference University of California, Berkeley Alumni House, Jan. 23-24, 2009

Carl E. Pray "Growth and Globalization of Private Research and Technology Transfer in LDCs." Robert E. Evenson Retirement Celebration, Yale University, September 13, 2008.

Carl E. Pray "Globalization of Private Agricultural Research and Innovation: Opportunities for Developing Countries?" Economic Research Service, USDA, Washington DC July 15, 2008.

Carl E. Pray "Innovation in Agricultural Biotechnology in India." Innovation and Economic Development in South Asia and New Jersey: Opportunities and Constraints, Center for Innovation Studies, Rutgers University, April 28, 2008.

Carl E. Pray discussion of "'Wait a Cotton Pickin' Minute!' A New View of Slave Productivity" by Alan L. Olmstead and Paul W. Rhode at the University of Pennsylvania Economic History Workshop, Philadelphia. November 9, 2007.

Carl E. Pray organized a symposium on “Bt Cotton - Second Generation Problems and Policy Responses in China.” and presented a paper at symposium by Jikun Huang, Ruifa Hu, Scott Rozelle, and Carl E. Pray “Resistant bollworms and secondary pests? How important are they?” at the American Agricultural Economics Association Annual Meetings, Portland, Oregon, July 29 – August 1, 2007.

Carl E. Pray. “Impacts of Biotechnology on Small Farmers and the Poor in Developing Countries Past Experience & Future Opportunities” at the Biotechnology Industry Organization International Convention, Boston, May 9, 2007.

Carl E. Pray. “Impacts of Biotechnology on Economic Development & Poverty Reduction: Past Experience & Future Opportunities in Asia.” "Financial Inclusion, Innovation, and Investments: Biotechnology and Capital Markets Working for the Rural Poor", Cornell University, Sage Hall--Johnson School of Management, April 20-21, 2007

Carl Pray was a joint organizer with Brian Wright and David Zilberman of U. of California, Berkeley, of the USDA NC-1034 SYMPOSIUM & JENNY LANJOUW MEMORIAL CONFERENCE, University of California, Berkeley, March 30 and 31, 2007. He presented a paper there co-authored with Guanming Shi “Research and Innovation in the Chinese Pesticide Industry.”

Carl E Pray “Chinese Food Production: Resource Constraints and Technological Possibilities” to the East Asia Forum at Johns Hopkins University, Baltimore, March 1, 2007.

Carl E. Pray, Marnus Gouse, John Rheeder, “Bt Maize as a Public Health Policy Tool in Africa?” American Agricultural Economics Association Annual Meetings, Long Beach, CA. August 23-26, 2006.

Carl E. Pray “Trends and Impact Of Investments And Implications For Governance and Future Investment Options In Agricultural Knowledge, Science, and Technology (AKST)” Funding Agricultural Research: Evolving Institutional Frameworks, NC1003 Symposium, Jekyll, Island, Georgia, March 24-25, 2006

Carl E. Pray and Anwar Naseem, "Intellectual Property Rights And Research Tools - Incentives On Barriers To Innovation?: Case Studies of Rice Genomics and Plant Transformation Technologies" American Agricultural Economics Association Annual Meetings, Providence, Rhode Island, July 25, 2005.

Carl E. Pray “Impact of Bt Maize on Small Farmers in South Africa.” American Agricultural Economics Association Annual Meetings, Providence, Rhode Island, July 25, 2005

Carl E. Pray “Registration Requirements and Their Costs and Implications: Lessons from LDCs” Presented at the conference on the Economics of Regulation of Agricultural Biotechnologies. Annual Meeting of NC-1003 Washington, DC. March 10-12, 2005

Carl E. Pray, “Biosafety Regulations in India and China: Costs and Enforcement.” Presented at the Workshop Agricultural Biotechnology for Human Development: Socio-economic

consequences issues. Science, Technology and Globalization Programme, Belfer Center, Kennedy School of Government, Harvard University. Cambridge Mass January 21-22, 2005.

Carl E. Pray, “Impact of Genetically Modified Crops in China and South Africa.” presented at the Conference On Biotechnology: Implications And Realities, United Nations, New York City, January 18, 2005.

Carl E. Pray. Panelist Session IV Innovation Systems: Coping with the Needs of the Developing World. Workshop on Global Challenges for Guiding and Managing Biological Technologies. The U.S. National Academies. Washington, D.C. October 25-26, 2004

Carl Pray, Michael Lawton, and Anwar Naseem – Do IPRs hold up or induce research and progress on research tools: Case studies of plant transformation and genomics research. Conference on “Innovation and Dynamic Efficiency in Agricultural Biotechnology.” October 14-15, 2004 at the Economic Research Service of USDA, 1800 M Street NW, Washington, DC

Carl Pray and Margaret Brennen – Measuring industry concentration in innovation markets using field trial and patent data. Conference on “Innovation and Dynamic Efficiency in Agricultural Biotechnology.” October 14-15, 2004 at the Economic Research Service of USDA, 1800 M Street NW, Washington, DC

David Schimmelpfennig and Carl Pray -- Has Seed Industry Consolidation had an affect on research effort? Conference on “Innovation and Dynamic Efficiency in Agricultural Biotechnology.” October 14-15, 2004 at the Economic Research Service of USDA, 1800 M Street NW, Washington, DC

Carl E. Pray. “The Precautionary Principle and Biotechnology in Developing Countries: The Unintended Impact of ‘Precautionary’ Regulations in India.” American Agricultural Economics Association meetings, Denver, August 1, 2004

Carl E. Pray, Caiping Zhang, Junfei Bai; Jikun Huang, William Hallman, Helen Aquino. “Consumer Acceptance of Genetically Modified Foods: A Comparison between US and China” American Agricultural Economics Association meetings, Denver, August 1, 2004

Qiang Chen, Anwar Naseem, and Carl Pray, “The Determinants of Research Productivity in the Agricultural Input Industry” American Agricultural Economics Association meetings, Denver, August 1, 2004

Carl E. Pray. “Patents, Prizes, Private Companies, and African Farmers.” Workshop on Technology Development in the Life Sciences: Intellectual Property and Public Investment for Pharmaceuticals and Agriculture at the Earth Institute, Columbia University, May 20, 21, 2004.

Carl E. Pray. “GM Rice in China: Current Status.” At a conference on the Future of Rice Biotechnology: Scientific Advances and Policy Issues. Yale University, April 30, 2004.

Clare Narrod, Keith Fuglie, and Carl E. Pray. "Supply-side Determinants of Change in the Livestock Sector." American Agricultural Economics Association meetings, Montreal, July 27-30, 2003

Cricket Hock, Anwar Naseem, Ferdaus Hossain, and Carl E. Pray. "Impact of Biotechnology on Plant Breeding" American Agricultural Economics Association meetings, Montreal, July 27-30, 2003

Carl E. Pray, Ramu Govindasamy, and Ann Courtmanche. "The Importance of Intellectual Property Rights in the International Spread of Private Sector Agricultural Biotechnology" American Agricultural Economics Association meetings, Montreal, July 27-30, 2003

Carl E. Pray. "The Impact of Plant Biotechnology on Developing Countries: Reducing Poverty and Improving Farmers' Health or Exploiting the Poor and Ruining the Environment?" Dickinson College Public Affairs Symposium (PAS) "The Power of Food: Pleasure, Politics, & Culture". February 17, 2003.

Carl E. Pray. "Plant Biotechnology in Developing Countries: Current Impact, Potential Impact, and the Implications for Policy Makers." Invited Presentation at the American Society of Agronomist's (ASA) Symposium on "Biotechnology: The perspectives from developing countries and partners: Towards a global strategy in plant biotechnology for food security and poverty alleviation," in Indianapolis, IN, 12-14 November 2002.

Carl E. Pray, Dan Johnson, and Keith Fuglie. "Private Sector R&D." Bretton Woods Conference on Agricultural Producers and Productivity. September 29 – October 2, 2002.

Carl E. Pray and Anwar Naseem "The Role of Patents in Inducing Research to Produce Science and Technology: Case Studies of Rice Genomics and Plant Transformation Technologies." Presented at the Western Agricultural Economics/American Agricultural Economics Association Joint Meetings, Long Beach, CA. July 28, 2002

Carl E. Pray. "Economic Impacts of Bt Cotton in China." Presented at Conference on Resistance Management for Bt-Crops in China: Economic and Biological Considerations." North Carolina State University, Raleigh, NC, April 28, 2002

Carl E. Pray. "Biotechnology as an Alternative to Chemical Pesticides: Bt Cotton in China." And "Stimulating Private Sector Investment in Biotechnology R&D." Workshop on the Cook /NJAES-SHESTCO (FMST) Collaboration on Biotechnology. August 13, 2001.

Carl E. Pray. "Corporate Structure: Status of Research." Research And Policy Needs Of A Chastened Agbiotech Sector. AAEA Preconference Workshop. August 4, 2001.

Carl E. Pray. "China. Agricultural Biotech Superpower?" Workshop on Global Governance of Technology: Meeting the Needs of Developing Countries. Center for International Development. Harvard University. Cambridge, Massachusetts. April 21, 2001.

Carl E. Pray. "Agricultural Research in Developing Countries: Can Research Help the Poor Access the Benefits of Biotechnology." National Academy of Sciences. Committee on Agricultural Biotechnology, Health and the Environment. Washington, DC, April 17, 2001.

Carl E. Pray and Scott Rozelle. "Bt Cotton in China." Brown Bag Seminar Series. The World Bank. Washington DC. March 5, 2001.

Carl E. Pray. "Public/Private Sector Linkages in Research and Development: Biotechnology and the Seed Industry in Brazil, China and India." Presented at the Allied Social Sciences Meetings, January 6, 2001.

Carl E. Pray. "Public and Private R&D in Asia." Conference on Raising Agricultural Productivity in the Tropics: Biophysical Challenges for Technology and Policy. Center for International Development at Harvard University. October 16-17, 2000.

Carl E. Pray. "Impact of Bt Cotton in China" at the Government Agricultural Economists Seminar Series. U.S. Department of Agriculture. Beltsville, Maryland. October 26, 2000.

David Schimmelpfennig, Carl Pray, and Ann Courtmanche. "Concentration, Regulation, and Maize Biotech Research: An International Perspective." American Agricultural Economics Association Annual Meetings. Tampa Bay. July 31, 2000

Carl E. Pray. "National Legislation Affecting FDI in Agriculture in Development Countries" American Agricultural Economics Association Annual Meetings. Tampa Bay. July 31, 2000

Carl E. Pray. "Reforming China's Seed Industry." American Agricultural Economics Association Annual Meetings. Tampa Bay. July 31, 2000

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao "Impact of Bt Cotton in China" Presented at C-FARE Policy Symposium on The Policy Implications of Biotechnology in the Food Sector. USDA/ERS Auditorium, Washington DC. May 15, 2000.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao "Impact of Bt Cotton in China." Seminar at International Food Policy Research Institute. May 9, 2000.

Carl E. Pray, Jikun Huang, Danmeng Ma, and Fangbin Qiao "Impact of Bt Cotton in China" presented at a Conference on "Biotechnology and the Public Interest: Prospects of Biotechnology in the Developing and Developed World". U.of California, Berkeley, April 28, 2000.

Carl E. Pray. "Are 'seed monies' available to support some preliminary activities by U.S. seed companies and LAC institutions?" Strengthening Private Commercial Sector Ties To Agricultural Research In The Americas. A workshop sponsored jointly by the American Seed Trade Association (ASTA), FONTAGRO, and Rutgers-the State University of New Jersey, Westin Hotel, New Orleans, Louisiana, February 2, 2000

Carl E. Pray. "Spread of Biotechnology in China." Policy Seminar, Economic Research Service, USDA. December 16, 1999.

Carl E. Pray. "A Framework for Public Private Collaboration in Latin American Agricultural Research." At a workshop Sponsored by FONTAGRO and Texas A&M University in College Station, Texas. November 11-12, 1999.

Carl E. Pray. "Exploiting the Multinationals: LDC Policies toward the Life Science Giants." International Center, Harvard University. October, 19, 1999.

Carl E. Pray. "Agricultural Research, Extension, and Technology Transfer Policy." In the Organized Symposium on Twenty Years of Rural Reform in China: Where Does Policy Stand? AAEA Annual Meeting, Nashville, TN. August 10, 1999

Margaret Brennan, Carl E. Pray, and Ann Courtmanche "Impact of Patent Consolidation on the Rate of Innovation in the U.S. Plant Biotech Industry." Presented at NE-165 Transitions in Agbiotechnology Conference. Washington, D.C., June 24 & 25, 1999.

Carl E. Pray. "Public and Private Collaboration in Agricultural Research in the Americas." Presented at the Regional Fund for Agricultural Technology Transfer (FONTAGRO) Discovery Dialogue Workshop at Texas A&M University, College Station Texas, April 7-9, 1999.

Carl E. Pray. "Role of the Private Sector in Linking the U.S. Agricultural Scientific and Technological Community with the Global Scientific and Technological Community." Presented At National Academy of Sciences, National Research Council, Board on Agriculture and Natural Resources Symposium on Organizing for International Agricultural Research Collaboration. April 1-2, 1999.

Carl E. Pray. "The Growth of Private Agricultural Research in Asian LDCs: Which Policies Matter?" presentation at Research Spillovers and Collaboration: A Symposium Sponsored by NC-208.. Tucson, Arizona, February 26-27, 1999.

Carl E. Pray. "The Private Sector and International Agricultural Technology Transfer." Paper presented at the ERS-Farm Foundation Workshop on Agricultural R&D, Rosslyn, Virginia, August 5, 1997.

Carl E. Pray. "Privatization of Agricultural Research Funding in China." Paper presented at the Organized Symposium on Alternative Source of Funding of Agricultural Research at the American Agricultural Economics Association Meetings. San Antonio, Texas. August 1996.

Carl E. Pray. "Impact of Corruption on Economic Development in Asia" Presentation at Bloustein School of Public Policy, Rutgers University. April 25, 1996.

Carl E. Pray. "The Role of Structural Adjustment, Regulatory Reforms, and Intellectual Property Rights in the Development of Seed Industries in Asia and Africa." Presentation at International Studies Program, Colombia University. April 17, 1996.

Carl E. Pray. "Who Will Feed China? Rice Biotechnology Research?" Presentation at Department of Economics, Haverford College. February 16, 1996.

Carl E. Pray. "Trends in Private Sector Research in the U.S." Presentation to the Board on Agriculture, National Research Council, National Academy of Science. Irvine, California. October, 1994.

Carl E. Pray. "The Privatization of Agricultural Research in the United Kingdom." Presentation at Economic Research Service, U.S. Department of Agriculture. October, 1994.

Carl E. Pray. "The Green Revolution: Is it over? Should it be?" Presentation at University Seminar Series, Haverford College. April 4, 1994.

Robert E. Evenson, Carl E. Pray, and Mark Rosegrant. "Agricultural Research and Productivity Growth in India." Presentation at Research Seminar Series, International Food Policy Research Institute. Washington, D.C. December, 1993.

Carl E. Pray. "Privatization of Food and Agricultural Research: An International Perspective." Paper presented at the Food Research Institute, Stanford University. November, 1993.

Carl E. Pray. "Privatization and Policy Reform in Russia: A Case Study of Plant Breeding Research and the Seed Industry." Presentation to Department Seminar, Department of Agricultural Economics and Marketing, Rutgers University. November, 1993.

Carl E. Pray. "The Future of the Seed Fertilizer Revolution: Discussion of Papers by Derek Byerlee, Robert E. Evenson and Mark Rosegrant." Presented at the American Agricultural Economics Association Pre Conference Meeting. Orlando, Florida. August, 1993.

Carl E. Pray, Mary Knudson, and Leonard Masse. "Impact of Changing Intellectual Property Rights on U.S. Plant Breeding R&D." Presented at NC204 Conference on U.S. Agricultural Research. Orlando, Florida. March, 1993.

Carl E. Pray. "Biotechnology and Agricultural Development." Presentation to Agricultural Development class, Yale University. February, 1993.

Carl E. Pray and Mary Knudson. "Impact of Intellectual Property Rights on Genetic Diversity: A Case Study of U.S. Wheat." Paper presented at Western Economics Association Meetings, San Francisco. July, 1992.

Carl E. Pray. "Trends in U.S. Food and Agricultural R&D: Signs of Declining Competitiveness?" Presentation at Conference on Dynamics of the U.S. Agricultural Research System: Challenges and Options. McLean, Virginia. October, 1992.

Carl E. Pray and Catherine Neumeyer. "Impact of Technology Policy on Research in the Agricultural Input Industries." Presentation at American Agricultural Economics Association Meeting. August, 1989.

Carl E. Pray and Catherine Neumeyer. "Problems of Omitting Private R&D Investment when Measuring the Impact of Public Sector R&D." Presentation at Agricultural Technology Management Workshop, Rutgers University. July, 1988.

Carl E. Pray. "Private Sector Research and Technology Transfer: Issues for Public Sector Research Managers and Policy Makers." Presentation at University of Minnesota/ISNAR/FAO Agricultural Research Policy Seminar. April 22, 1986.

Carl E. Pray. "The Institutional Development of National Agricultural Research Systems in South and Southeast Asia." Presentation at Association for Asian Studies Meetings. San Francisco, March 25, 1983.

Carl E. Pray. "The Returns to Agricultural Research and the Distribution of the Returns in the Pakistani Punjab." Paper presented at Atlantic Economic Society Conference. New York. October, 1981.

Conference Organization and Management

Carl E. Pray led the organization and planning the program of the 13th Annual International Consortium on Agricultural Biotechnology Research in Ravello, Italy (www.economia.uniroma2.it/icabr/2009/) June 17-19, 2009

Carl E. Pray and David Zilberman organized the conference "The Biofuel Situation and Policies in Developing Countries" U.C. Berkeley, CA, May 7 and 8, 2009

Carl E. Pray and David Zilberman organized a conference "Agricultural Biotech in Developing Countries" U.C. Berkeley, January 23rd and 24th, 2009 (www.berkeleybioeconomy.org)

Carl E. Pray led the organization and planning the program of the 12th Annual International Consortium on Agricultural Biotechnology Research in Ravello, Italy (www.economia.uniroma2.it/icabr/2008/) June 2008.

Carl E. Pray organized two symposia for the Center for Innovation Studies at Rutgers:

March 27, 2008 “Improving Technology Transfer at the University: Lessons from Social Scientists and from Practitioners.”

April 28, 2008 “Jersey Roots, Global Reach: Innovation and Economic Development in South Asia and New Jersey: Opportunities and Constraints.”

Carl E. Pray and Anwar Naseem organized a conference entitled “Innovation and Dynamic Efficiency in Agricultural Biotechnology.” October 14-15, 2004 at the Economic Research Service of USDA, 1800 M Street NW, Washington, DC

Carl E. Pray and Anwar Naseem organized the NC1003 Annual Conference “Patents and Their Implications for Public and Private Sector Research.” Hyatt Regency in New Brunswick, NJ. February 28, 2003 and March 1, 2003.

Carl E. Pray and Fred Gould organized conference on “Resistance Management for Bt-Crops in China: Economic and Biological Considerations.” North Carolina State University, Raleigh, NC, April 28, 2002

Carl E. Pray, Jikun Huang and Scott Rozelle organized International Workshop on “Plant Biotechnology Policy in China: Initial Findings, Research Methods, and Research Priorities.” Center for Chinese Agricultural Policy, Chinese Academy of Sciences, Beijing July 18-20, 2001

Carl E. Pray organized Conference on *Indian Intellectual Property Rights: Continuity and Change*. Global Programs: Rutgers University. April 24, 1998.

Carl E. Pray and Ira Gang planned and ran one day seminar on Current Economic Research on South Asia. Rutgers University. April 1997.

Carl E. Pray organized workshop at the World Bank on Chinese agricultural research. August, 1995.

Carl E. Pray, David Gisselquist and Jitendra Srivastava. Organized a two day seminar at the World Bank on barriers to the transfer of plant varieties, with June, 1995.

Carl E. Pray and Vernon W. Ruttan developed and managed University of Minnesota's annual two week Agricultural Research Policy short course. 1983-1986.

Nonrefereed Publications, Unpublished Papers and Reports

Carl E. Pray and David Zilberman. “The Emerging Global Biofuel Industry: The Biofuel Situation and Policies in Developing Countries.” *Agricultural and Resource Economics Update*. V. 12, no. 5. May/June 2009.

Scandizzo, P.L., Zilberman, D., Pray, C.E. (2009). A personal memorial: Vittorio Santaniello: Founder of the international consortium on agricultural biotechnology research (ICABR). *AgBioForum*, 12(1), 4-7. Available on the World Wide Web: <http://www.agbioforum.org>.

Clare A. Narrod, Carl E. Pray, and Marites Tiongco “Technology Transfer, Policies, and the Role of the Private Sector in the Global Poultry Revolution” IFPRI Discussion Paper No. 00841 <http://www.ifpri.org/pubs/dp/IFPRIDP00841.pdf>. December 2008

Jikun Huang, Carl E. Pray and Scott Rozelle “Bt cotton benefits, costs and impacts in China” Working Paper 202, Institute of Development Studies, University of Sussex, Sussex, U.K. September 2003

Carl E. Pray and Anwar Naseem. “Economics of Agricultural Biotechnology Research.” ESA Working Paper 03-07 Rome:U.N.Food and Agricultural Organization. 2003. http://www.fao.org/es/esa/wp/ESAWP03_07.pdf. A background paper for the 2003 *State of Food and Agriculture* Report of the Food and Agriculture Organization of the United Nations. 2003.

Carl E. Pray and Anwar Naseem. “Biotechnology R&D: Policy Options to Ensure Access and Benefits to the Poor.” ESA Working Paper 03-08 Rome:U.N.Food and Agricultural Organization. 2003. http://www.fao.org/es/esa/wp/ESAWP03_08.pdf. A background paper for the 2003 *State of Food and Agriculture* Report of the Food and Agriculture Organization of the United Nations. 2003.

Eduardo Trigo, Greg Traxler, Carl Pray, and Ruben Echeverria Agricultural Biotechnology And Rural Development In Latin America And The Caribbean: Implications for IDB Lending. Sustainable Development Department. Technical Paper Series. InterAmerican Development Bank. Washington, DC. 2001.

Carl E. Pray and Dina Umali-Deininger. “Une place a prendre?” *Courrier de la Planete*. No.62. Volume II 2001. pp. 44-46.

Scott Rozelle, Jikun Huang, and Carl E. Pray. “Re-engineering China’s Green Revolution: A Study of Reform, Technology Policy, and China’s Food Economy.” Unpublished book manuscript. 1999.

Songqing Jin, Carl E. Pray, Jikun Huang, and Scott Rozelle. “Commercializing Agricultural Research and Fungible Government Investment: Lessons from China.” Submitted to *American Journal of Agricultural Economics*. December 1998. Now being revised.

Narrod, Clare, Carl Pray, and Willis Peterson. “Technology, Policies, And The Global Poultry Revolution.” Unpublished paper. 1999

David Gisselquist and Carl Pray. *Deregulating Technology Transfer in Agriculture: Reform’s Impact on Turkey in the 1980s*. Policy Research Working Paper no.2086. The World Bank: Washington, D.C. March 1999.

Keith Fuglie, Ruben Echeverria, and Carl E. Pray. “Science and Technology for Agricultural Development: New Institutions for Funding and Performance.” Paper presented at the

Conference on The New Strategic Role of the Rural Sector for Latin America's Development. Cartagena, Colombia, July 8-10, 1998.

Carl E. Pray, Bharat Ramaswami and Tim Kelley. Liberalization, Private Plant Breeding and Farmers' Yields in the Semi-Arid Tropics of India. Unpublished paper World Bank. April 1998.

Carl Pray and Tim Kelley, Impact of Liberalization and Deregulation on Technology Supply by the Indian Seed Industry. Unpublished paper ICRISAT. December 1997.

Carl E. Pray "Final Report of the China Agricultural Research Funding Project." Report to the World Bank Research Committee, September 22, 1997

Carl E. Pray, Scott Rozelle, and Huang Jikun. "Who Will Feed China? Can Chinese Agricultural research do the Job?" submitted to *Food Policy*. March, 1997.

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Carl E. Pray. "Seed Policy in China." Unpublished report prepared for U.N. Food and Agriculture Organization. January, 1995.

Carl E. Pray. Book Review of *Science for Agriculture* by Wallace Huffman and Robert Evenson. in *American Journal of Agricultural Economics*. Spring, 1994.

Carl E. Pray. "Impact of Privatization on Levels of Agricultural Research Expenditure in the United Kingdom, Chile, and the United States." submitted for consideration as a selected paper at the 1994 American Association of Agricultural Economics meetings.

Carl E. Pray. "Organization, Funding and Productivity of Agricultural Research in the United States." Unpublished report prepared for the Latin American Technical Division, The World Bank. February, 1992.

Carl E. Pray. "Plant Breeders' Rights: Enforcement, R&D, and Potential Importance for Developing Countries." Unpublished report prepared for the AGRPS Division, The World Bank. April, 1991.

Carl E. Pray. "Determinants of Output and Productivity Growth in Eastern India: Implications for Future Government Investments." Unpublished report prepared for the India Division, The World Bank. February, 1991.

Carl E. Pray. "High Yielding Varieties and the Indian Seed Industry Background paper for the 1991 Country Economic Memorandum." Unpublished report prepared for the India Division, The World Bank. October, 1990.

Carl E. Pray, Catherine Neumeyer and Mary Knudson. "R&D by U.S. Agricultural Input Industries: Do Policies Matter?" U.S. Department of Agriculture, Economic Research Service, Agricultural Information Bulletin, 1990.

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Margaret Andrews and Carl E. Pray. Book Review of *U.S. Agriculture and Third World Development: The Critical Linkages*, by Randall B. Purcell and Elizabeth Morrison (eds.) in *American Journal of Agricultural Economics*. No. 70, August, 1988.

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Carl E. Pray. "Agricultural Research and Technology in the 1990s in Asia and the Near East: Trends and Possible Strategies for AID." Unpublished report prepared for the Asia/Near East Bureau, USAID. August, 1988.

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Vinod Thomas, Carl E. Pray, Gotz Schreiber and Risto Harma. "Bangladesh Food Policy and Crop Diversification." The World Bank, 1981.

Carl E. Pray. "The Green Revolution: An Appraisal." *Economics Impact*, No. 39, 1982. (This is an edited version of the *Annals* article.)

Carl E. Pray and A. B. Siddique. *Survey of Irrigated Cropping Patterns in Bangladesh and the Implications for the Draft Second Five Year Plan*, Agricultural Economics and Rural Social Science Paper No. 8, Bangladesh Agricultural Research Council, Dhaka, 1980.

Carl E. Pray and Chitrita B. Abdullah. *Bibliography of Agricultural Economics and Rural Social Sciences with Special Reference to Bangladesh*, Supplement II, Agricultural Economics and Rural Social Science Paper No. 7, Bangladesh Agricultural Research Council, Dhaka, March 1980.

Carl E. Pray. "The Report to the BCSRP Evaluation Committee on Current and Future Possibilities for Soybean Production and Utilization and Some Suggestions for Future Research." Bangladesh Agricultural Research Council, Dhaka, 1980.

Phillip Church, Carl E. Pray and M. Rahman. "Report of the Committee of Agricultural Input Prices and Subsidies for the Second Five Year Plan." Mimeo, Bangladesh Planning Commission, 1979.

Research and Institutional Grants

Bill & Melinda Gates Foundation “Measuring the Ex-Ante Impact of Water Efficient Maize for Africa” Subcontract with Kansas State University as the primary contract. March 2009 – February 2011. Rutgers subcontract \$172,000.

Bill & Melinda Gates Foundation. “Measuring Private Research and Innovation in South Asia and Sub-Saharan Africa.” February 2, 2009 to September 2010. \$ 499,000.

Rockefeller Foundation “Evaluating Rockefeller Foundation Research and Technology Transfer Projects on Drought Tolerant Rice in Asia.” January 1, 2008 to December 31, 2010. \$560,000.

Economic Research Service, USDA. “Globalization of Private Sector Agricultural Research” September 2007 to August 2009. \$100,000

Rutgers Academic Excellence Fund Grant. “Rutgers Center for Innovation Studies” with David Finegold, Clinton J. Andrews, and Michael Geselowitz, July 1, 2007 to June 30, 2008. \$50,000

Rockefeller Foundation “Evaluating Research on Drought Tolerant Rice in Asia: Design Phase.” September 2006 to August 2007. \$60,000.

Rockefeller Foundation. “Economic, socio-economic and health effects of adoption of Bt white maize in South Africa: Subsistence and commercial farming” with J.F. Kirsten, Agricultural Economics, University of Pretoria. Wally Marasas, The Medical Research Council of South Africa, Promec Unit, South Africa and David Schimmelpfennig USDA-ERS. October 2003 – Dec.2005. \$120,000.

International Food Policy Research Institute. “Costs and Efficiency of Biosafety Regulations of Insect Resistant Cotton, Maize and Rice in China” with CCAP, Beijing. November 2003 to October 2004. \$44,000

Economic Research Service, USDA. “Plant Biotechnology Regulations and Policy in India: Are They Serving Farmers and Consumers?” July 2003 – June 2005. \$42,000 with the Indian Development Foundation.

Monsanto Research Foundation. “Measuring the Impact of Bt. Cotton in China in the Four Years of Commercial Use.” July 2001 to August 2002. \$52,000.

Rockefeller Foundation. “Diffusion and Adoption of Agricultural Biotechnology in South Africa: Spillovers, Private Sector Research, and Public Benefits” with J.F. Kirsten, Agricultural Economics, University of Pretoria. David Schimmelpfennig USDA-ERS.. February 2001 to May 2002. \$97,000.

Initiative for the Future of Agriculture and the Food System. USDA “Innovation and Dynamic Efficiency in Agricultural Biotechnology.” With Anthony Artuso, Margaret Brennan and others. Sept.2000 to August 2003 (extended to October 2004) . \$900,000.

Rockefeller Foundation. Biotechnology Policy Planning in China with Jikun Huang
Scott Rozelle. Sept 2000 to August 2001. \$92,000

World Intellectual Property Organization. The Importance of Intellectual Property Rights in the
International Spread of Agricultural Biotechnology. October 2000 to July 2001. \$35,000.

Rockefeller Foundation. Proposal to Measure the Impact of Transgenic Cotton on Farmers
and Policy Implications August 1999 to July 2000. with Jikun Huang. \$45,000.

USDA, Economic Research Service, Impact of Patent Concentration on the Rate of Innovation in
the U.S. Plant Biotech Industry. June 1999 to December 2000. \$55,000.

Rockefeller Foundation. Commercialization of China's Research and Extension System. April
1998 to May 1999, \$50,000. With Huang Jikun and Scott Rozelle.

USDA, Economic Research Service: Public and Private Research and Technology Transfer.
6/2/98 – 10/31/98. \$26,000.

USDA, Economic Research Service: Public Plant Breeding Programs. 9/4/97-12/31/98. \$5,000.

World Bank: Research Committee. Funding the Chinese Agricultural Research System. August
1996 to July 1997. \$39,500. Principal Investigator.

World Bank. Research Committee. Barriers to Agricultural Technology Transfer, December
1995 to July 1997. \$180,000. Co-principal investigator. 33% of project.

USDA Cooperative Agreement. Private Agricultural Research In Asia. May 1996-December
1997. \$41,900. Co-principal investigator. 50% of project.

USDA Cooperative Agreement Case Study of Collaborative Research: Genetic Enhancement of
Maize Project. \$20,000. Co-principal investigator. 10% of project.

Rockefeller Foundation. Seed Industry Policies as a Constraint to Agricultural Technology
Transfer. June 1996 to present. \$70,000. Co-principal investigator. 10% of project.

Rockefeller Foundation. Rice Research in China. June 1995-June 1996. \$80,000. Co-principal
investigator. 33% of project.

Rockefeller Foundation. Cost of Rice Biotechnology Research in India. July 1992-June, 1993.
\$30,000. Principal Investigator

CONSULTANCIES

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Food and Agriculture Organization of the United Nations. Background paper on biotechnology and agricultural research for the 2004 State of Food and Agriculture Report. January – March 2003.

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Quaker Oats. Returns to Oats Research in the U.S. and Canada. July 2000.

World Bank. Wrote and presented “Technology, IPRs, and Reform Options: A Case Study of the Seed Industry with Implications for Other Input Industries.” At Conference on *Reforms in Indian Agriculture for Growth, Efficiency, Equity and Sustainability*. New Delhi, India. March 1999.

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Ministry of Planning, Panama, Develop Guidelines for Studies on Agricultural Policy and Rural Institutions in Panama, 1983.

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AID/Asia Bureau Meetings on AID Priorities for Research in Agriculture, October, 1982.

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The World Bank, Bangladesh Food Policy and Crop Diversification Mission, February, 1981.

Team Leader, Minnesota Reconnaissance Team on the Pakistan Agricultural Research System, December, 1981.

PROFESSIONAL MEMBERSHIPS

American Agricultural Economics Association

American Economics Association

International Association of Agricultural Economists

American Association for the Advancement of Science

PERSONAL INFORMATION

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