Curriculum Vitae: Philip A. Rutter

Badgersett Research Farm, 18606 Deer Road, Canton, MN 55922, (507)-743-8570, Woodyag@aol.com; Sept, 2006

Born: Bethesda, Maryland, USA; October 21, 1948, married, three children.

Education:

BA Oberlin College, 1970; with High Honors in Biology; Major— Biology.

MS University of Minnesota, 1975; Zoology

Additional— All course work for the PhD in Zoology, with minor in Ecology and Behavior, was completed at the University of Minnesota by 1975. At that time I realized that the university academic world was not what I wanted for my future, and the decision was made to leave and start Badgersett Research Farm. While the PhD work was in the field of Zoology, the underlying interest was always evolution and ecology, with strong interest in plants and plant communities.

Academic Honors:

Sigma Xi scientific honorary society; elected 1969
High Honors in Biology, Oberlin College, 1970
National Science Foundation Trainee, 1970—73
Teaching Asst, Dept. of Biology, U of Minnesota, 1973—74
Teaching Asst, Dept. of Ecology & Behavior, U of Minnesota, '74—75
Guest Scientist, Hubei Academy of Agricultural Sciences, P. R. China, 1989 and 1991

National Award:

Good Steward Award; National Arbor Day Foundation, 1996

Career achievements:

Founder, owner, and Director, Badgersett Research Farm— 1977— 2000

Badgersett Farm started as a privately owned and operated, shoestring budget, research and development enterprise, with the primary goal of pursuing the intensive domestication of woody perennial plants for agriculture. Research includes breeding projects with multi-species hybrid chestnuts and hazels. More than 8,000 hybrid chestnuts have been screened at Badgersett with 18,000 currently under evaluation. Hazel plantings consist of some 60,000 bushes, mostly young. Several thousand new trees are planted annually, for both screening for crop potential and small-scale commercial demonstration. In 1992 the decision to begin commercial production of our hybrid hazelnut seedlings was made, and a greenhouse constructed to enable us to produce some 80,000 containerized plants/year. These seedlings are the nucleus for a new hazelnut industry in the upper Midwest. More than 2,000 potential growers have already expressed interest in trying these plants. The first commercial trial plantings began in 1993, in locations from Virginia to Idaho. In 1994 major demonstration plantings were made on military bases in Kansas, Nebraska and Minnesota; in 1995, plantings began for 9 acres of production hazels at Arbor Day Farm, NE

President/CEO of Badgersett Research Corporation, a C corporation. 2000-present.

The original business entity “Badgersett Farm” became a C type corporation in 2000. Plantings of proprietary Badgersett hazel and chestnut breeding lines expanded to two additional sites in Wisconsin and one in Minnesota, on land leased by the company. Web: badgersett.com.

Founding President, The American Chestnut Foundation (TACF)— 1982

The Foundation is a national non-profit {501(c)(3)}, membership organization, incorporated in Washington, D.C. The goal of the Foundation is the restoration of the American chestnut to our forests, for the purposes of economic, environmental, and moral benefit.

President, The American Chestnut Foundation— 1982— 1992

President Emeritus, The American Chestnut Foundation— elected 1992

In acknowledgement of service, the Board elected me President Emeritus, with a lifetime seat on the Board.

Member, Board of Directors, The American Chestnut Foundation— 1982— present

Member, Scientific Steering Committee, American Chestnut Foundation—1983— present

Chairman, Fundraising Committee, The American Chestnut Foundation, 1985—90

During my tenure as Fundraising Chair, income increased from $15,000 to $100,000/yr.

President, Northern Nut Growers Association, 1989—90.

The NNGA is an 80 year-old national organization of professionals and amateurs who grow and develop nut crops

Member, Board of Directors, Northern Nut Growers Association, 1990-93.

Consultant to the National Geographic Society, 1988— 1989.

My work on chestnuts and TACF has been featured in the February 1990 issue of *National Geographic Magazine* , and the June 2003 issue of *The Atlantic Monthly*.

Founder, The American Chestnut Foundation Wagner Research Farm, Meadowview, Virginia. 1989.

I conceived and found the resources for this facility dedicated to TACF chestnut research. This first facility comprises 20 acres, house and barn; a PhD resident superintendent, and approximately 20,000 seedling trees growing. 2 additional, larger, farms have been added to the system.

Chairman, TACF Wagner Research Farm Operating Committee, 1989—91

Reviewer, US Congressional Office of Technology Assessment (OTA) global warming book *Changing by Degrees,* food production section. 1990.

Founder, President and Acting CEO, NeoEdge, Inc.; 2000 to present. NeoEdge, Inc. is a C corporation formed to develop non-woody agriculture related intellectual property; one US patent has been awarded, and corresponding international patents; 2 more are in process.

Inventor, US Patent 6,207,294; for a basic metallurgical fabrication process, 2001.

Co-Founder, American Heartland Hazelnut Association, 2002; a growers association for hybrid bush hazel growers, formed to aid in development of the crop.

Activities:

Seminars— From 1984 to 1990 I gave over 60 seminars on chestnut history and research, to both academic and general audiences. Among the lectures;

Michigan State; Ohio State; Penn State; Oberlin College; The Harvard Botanical Museum; The Harvard Forest; Yale University; Rutgers University; The Brooklyn Botanic Garden; The Morris Arboretum; The American Forestry Association; Maryland Dept. of Forestry; West Virginia University; Cornell University; SUNY Syracuse; The North Carolina Botanical Garden; The Great Smoky Mountains National Park; the University of Tennessee; the University of Kentucky; the USDA North Central Forest Experiment Station; SIU Carbondale; the Northern Nut Growers Association, the University of Minnesota, and the Hubei Academy of Agricultural Sciences (China).

Germplasm Collection Expedition— in Sept.-Nov. 1989 I managed to reach several remote locations in Hubei Province, China, and was successful in bringing back a unique collection of wild chestnut germplasm.

Research— primary directions have included the following:

•Chestnut Ecology- reestablishment of wild chestnut forests must be predicated on knowledge of the natural ecology of the tree. I have stimulated and engaged in basic descriptive ecology of the few remaining stands.

•Chestnut Pollination Biology- hybridization of chestnuts was plagued by erratic pollination success. I was the primary researcher developing new techniques, which are now reliable.

•Woody Agriculture-

The phrase denotes intensive co-production of food and fuel from highly domesticated woody plants; sufficiently productive to successfully replace traditional annual crops. Work has been conducted at Badgersett Research Farm for the past 25 years, with rapid expansion of data and plantings in the last 10 years. A basic goal of the work is to develop crop systems with realistic scenarios for integration into the present world agricultural systems; perennial crops which can and will be adopted, for economic reasons. Yields comparable to annual crops have been achieved, on an experimental basis.

Since 1990 I have given more than 30 invited seminars on woody agriculture, including the General Mills research staff, the US EPA, the US Congressional Office of Technology Assessment, the Practical Farmers of Iow, and the U. of Minnesota Depts. of Ecology and Agronomy. I also gave the keynote address for the "New Opportunities in Agriculture" conference, sponsored by U. of Nebraska, 11/90.

As of 1991 the formal agreement of cooperative research and germplasm exchange between Badgersett Research Farm and the Peoples Republic of China has been expanded; we have 3 research plots in Hubei Province, and funding of ¥40,000 RMB/year from the provincial government.

•Grants & Awards

Badgersett Research Farm was the recipient of a grant from the Minnesota Dept. of Agriculture Energy and Sustainable Agriculture Program, to demonstrate and develop our hybrid hazelnuts for use as a cash crop-windbreak. The grant was $16,000 for 1992-94.

Badgersett Research Corporation was the recipient of a contract with the University of Minnesota Experiment in Rural Cooperation, $45,000 for 1999-2001, to support a Research Associate at the Farm.

Support from the University of Minnesota Experiment in Rural Cooperation, continues; $35,000 for 2002-2003, to support a PhD student at the University, working in directed research on the nutritional requirements of Badgersett hybrid bush hazels.

•Global Warming-

Implications of this work on woody agriculture have led to my inclusion in discussions of global warming. Papers were presented in Washington DC to the Second North American Conference on Preparing for Climate Change, in December 1988, in Cairo, Egypt at the World Conference on Preparing for Climate Change, in December 1989, and at the Global Warming International Conferece XIV in Boston in 2003. A poster presentation was made at the Forests and Global Change Conference in Washington DC, June 1991.

In 1994 the US Army and US Air Force made plantings of Badgersett hybrid hazelnuts at 3 locations, primarily in view of the potential for woody crops to offset global atmospheric carbon increases.

•New Crop Development-

Badgersett hybrid hazelnuts are now the focus of increasing development, both from grass-roots farm plantings and university research. Universities growing and researching BRC hazels include; Rutgers, U. of MN, U of WI, U of IL, U of NE, U of KS, U of MT, U of ME, and the Northern Alberta Technical Institute. Approximately 500 farmers across the USA and Canada have significant plantings; about 50 have plantings intended for production and sale.

Languages: Working German; fair comprehension of Spanish and French, rudimentary Mandarin. Graduate Record Examination (GRE) English score: 800. Miller Analogies raw score: 96.

Selected Professional Papers:

Rutter, P.A., and C.R. Burnham. 1982. The Minnesota chestnut program— new promise for breeding a blight-resistant American chestnut, 73rd *Annual Report of the Northern Nut Growers Assoc.* pp. 81—90.

Burnham, C.R.; P.A. Rutter.; and D.W. French. 1986. Breeding Blight-Resistant Chestnuts. *Plant Breeding Reviews*, vol. 4. pp 347—397

Rutter, P.A. 1987. Chestnut ecology and the developing orcharding industry. *Proc. of the 2nd Pacific Northwest Chestnut Congress.* The Chestnut Growers Exchange, Inc., P.O. Box 12632, Portland, OR 97212

Rutter, P.A. 1987. Badgersett Research Farm; projects, goals, and plantings. *78th Annual Report of the Northern Nut Growers Assoc*. pp.173—186

Rutter, P.A. 1987; 4th edition, 1990. A chestnut pollinator's handbook. 20 pages, diagrams. Available from Badgersett.

Rutter, P.A. 1989. Reducing Earth's "greenhouse" CO_2 through shifting staples production to woody plants. Proc. of the Second North American Conference on Preparing for Climate Change, pp 208-213. The Climate Institute, 316 Pennsylvania Ave., SE, Suite 403, Washington, DC 20003

Paillet, F.L., and P.A. Rutter.. 1989. Replacement of native oak and hickory tree species by the introduced American chestnut (*Castanea dentata*) in southwestern Wisconsin. *Canadian Journal of Botany* , vol. 67, #12; pp 3457-3469

Rutter, P.A. 1990. Growing Chestnut Trees: The American Chestnut Foundation Handbook. The American Chestnut Foundation, College of Agriculture and Forestry, West Virginia University, Morgantown, WV 26506-6057. 13 pages

Rutter, P.A. 1990. Woody agriculture: increased carbon fixation and co-production of food and fuel. Paper presented to the World Conference on Preparing for Climate Change, Cairo, Egypt, December 1989. The Climate Institute, Washington DC. reprinted IN: *80th Annual Report of the Northern Nut Growers Assoc*.

Rutter, P.A., G. Miller, and J. Payne. 1990. Chestnuts (*Castanea)* . In: *Genetic Resources of Temperate Fruits and Nuts.* J.N. Moore & Ballington, J.R. Jr., eds. International Society for Horticultural Science. *Acta Horticultura* 290; pp 761-788

Rutter, P.A. 1992. A new experimental approach to producing self rooted chestnut clones. *82nd Annual Report of the Northern Nut Growers Assoc*.

Talks Given with Manuscripts in Preparation:

Rutter, P.A. 2002. The integrated reproductive ecology of the genus Castanea. Annual Meeting, The American Chestnut Foundation.

Rutter, P.A. 2002. Woody Agriculture, Principles, Practices, and Progress. Global Warming XIV Conference, Boston 2002