Clinton Cleon Shock

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EMPLOYMENT

Dates	Rank or Position, Institution	Duties	Emphases
1984 - present	Professor & Superintendent (Associate professor '84-'91) Malheur Experiment Station Oregon State Univ., Ontario	Research and administration	Plant production, watershed stewardship, drip irrigation, water quality, plant nutrition erosion control; Potatoes, onions, poplars, sugar beets, new crops. Soil water sensors.
1982 - 1984	Assistant Professor Louisiana State Exp. Station Jeanerette, Louisiana	Research	Forage legume introduction, cultural practices, and pasture productivity.
1978 - 1982	Research Assistant & Graduate Student University of California, Davis	Research	Pasture and rangeland fertility; sulfur nutrition of forage plants; plant competition for scarce resources.
1978	Acting General Manager IRI Research Institute Brasil	Research and administration	Revegetation of infertile acid Amazon subsoils: specie adaptation, soil fertility, practical operations manual.
1975 - 1978	Manager and Superintendent IRI Experiment Station Matão, São Paulo, Brasil	Research and administration	Collection, identification of 700^{+} new accessions of grass & legumes. Amazon revegetation research.
1974 - 1975	Manager Coffee farms, Pedro Juan Caballero, Paraguay	Administration	450 hectares coffee & soybeans. Historic July 1975 frost killed coffee trees.
1973 - 1975	Project Leader IRI Research Institute São Paulo Mountains, Brasil	Research	Revegetation of infertile cut & fill subsoil: specie adaptation, optimum fertilization, application of mechanical methods.
1972 -1973	Laboratory Technician & Graduate Student University of California, Davis	Research	Development of laboratory procedures for better estimate of K availability from soils.
1968 - 1972	Extension/Social Missionary United Methodist Church Mato Grosso, Brasil	Extension, Farm Credit, & Coop. Admin.	Access to credit and free markets for homesteaders. Cultural practices of homesteaders' crops.

EDUCATION

Dates	Degree Earned	Name of Institution	Major Field
1978 -1982	Ph.D.	University of California, Davis	Plant Physiology
1972 -1973	M.S.	University of California, Davis	Horticulture
1962 -1966	B.A.	University of California, Berkeley	Mathematics

PERSONAL DATA

Date of birth: 6/11/44
Place of birth: Los Angeles, CA
Married, three children over 21 years old

LANGUAGES

Portuguese: Reasonably fluent
Spanish: Conversational

PUBLICATIONS, AS OF JANUARY, 2005

Total 796: Referred journal articles and book chapters 51; Other journal articles 15; Reports specifically for growers, users 487; Professional proceedings and abstracts 216; Consultant reports 13; Others 14.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Society of Horticultural Science, 1993 - present. Current Consulting Editor, HortScience.
American Society of Agronomy, 1981 - present. Current Chair of Division A-7, 2004-2005.
American Society of Agricultural Engineers, 2000-present.
American Association for the Advancement of Science, 1981 - present.
American Association of Sugar Beet Technologists, 1991 - present.
American Society of Plant Biologists, 1981 - present.
Crop Science Society of America, 1981 - present.
Soil Science Society of America, 1981 - present.
Society for Range Management, 1981 - present.
Sigma Xi Scientific Research Society, 1981 - present.
Potato Association of America, 1986 - present. Physiology Section Director, 2003-2004.
National Onion Association, 1987 - present.

UNIVERSITY, SCHOOL, AND DEPARTMENT SERVICE

OSU representative to W-128 MicroIrrigation working group, 2000 to present. W-128 Chairman. Manage web site .
OSU representative to S-1004, Development and Evaluation of TMDL Planning and Assessment Tools and Processes.
Participant in the interstate Mid-Snake river TMDL process, 2000 to present.
Member Treasure Valley Pest Alert Team, 2000 to present.
LAG SB1010 advisor for the Malheur River Watershed, 1998-2000.
Member of Oregon Potato Variety Development Team lead by Al Mosley. 1986 - present.
Member of WR-27 working group on potato variety development
Interagency Water Quality Team, Malheur County, March 1990 - 1998.
State Conservation Advisory Committee, Oregon Water Resources Department, 1993 - 1995.
Malheur Watershed Council, 1995 - present.
Executive Committee, 1997-present
OSU representative to a DEQ Technical Advisory Committee on Ground Water Contamination. 1989-1995.
Owyhee Watershed Council, 2000 – present, active on the education and assessment committees.

SERVICE TO THE PROFESSION AND REVIEWS OF PROJECTS AND PAPERS

Editorial Board, Agricultural Sciences in China, 2002 to present.
Consulting Editor, HortScience 2004.
Associate Editor, HortScience, 2000 - 2003.
Assisted Malheur County Officials in writing a successful "Regional Economic Development Strategy" Proposal for $290,000. 1988. Funding for approximately $ 1,400,000 through 1998.
Conservation practices evaluation; ASCS & Soil Conservation Service. 1988, 1998, 2003, 2004.
Wrote GWEB list of practices to protect water quality for Oregon irrigators, 1998.
Edited Malheur-Owyhee Watershed Plan, 1999 and 2000, and Malheur County Groundwater Action Plan, 1991, review of groundwater plan in 2003, Washington State Moses Lake Phosphorus TMDL 2004..
Reviewed project proposals for LISA, ARS, STEEP, SBIR, etc.
Reviewed AES projects from the Departments of Crop Science, Foods and Nutrition, Horticulture, and Entomology and from the branch experiment stations at Klamath Falls, Hermiston, Central Oregon, and Pendleton. 1986 - present.
Reviewed research proposals of faculty in the departments of Crop Science, Soil Science, Foods and Nutrition and Entomology and extension staff for Nampa-Nyssa Sugar Beet Growers, Idaho-Eastern Oregon Onion Growers, and the Oregon Processed Vegetable Commission. 1985 - present.
Reviewed papers prior to submission for University of Idaho, ARS, and OSU faculty.
Reviewed papers for the Agronomy J, Crop Science, Soil Science, J Environmental Quality, American Soc. of Agricultural Engineers, Am. J. of Potato Research, HortTechnology, and HortScience. 1985 - present.

SERVICE TO THE COMMUNITY

Ontario Chamber of Commerce, 1985 - present.
Board of Directors 1987 - 1990.
Leader of Ontario team to the Portland Marathon, 1986, 1987, 1988.

Ontario Development Corporation, 1989 - 1998. (Encourages community development).
Kiwanis Club, 1982 - present.
President, (acting 1983-1984 in LA), 1989 - 1990 and 1996-1997 at Ontario, OR.
Board of Directors, 1983 - 1992, 1997-1998.
Vice President, 1988 - 1989.
Chairman of Youth Committee, 1987 - 1988.
Chairman of Tree Planting Committee, 1986.
March of Dimes Walk America, 1985 - present.
Chairman 2002, 2003, 2004
Boy Scouts of America, adult leader 1980-present
Cubmaster, Pack 400, 1990 - present, rebuilt community cub pack.
Scoutmaster, Troop 400, 1991 - present, founded community scout troop.
District Order of the Arrow Advisor 1987 - 1999.
District Camping Promotions Chairman, 1990 - 1993.
Asst. Scoutmaster, Troop 421, 1984 - 1989.
Organized Order of the Arrow service weekends in the 1980s.
Organized dozens of community service projects and four camporees.
University of Scouting instructor, 1994, 1995, 1996, 1997, 1998, 2000. 2001, 2002
Adult staff, National Jamboree Troop 719, 1997
Adult staff, Senior Outdoor Leadership Experience (for older youth), 2000.
United Methodist Church, 1960-present
Trustee, Wesley Foundation, 1962-1966
Agricultural and development missionary for rural poor, Mato Grosso, Brazil, 1968-1972
Co-Chairman of Outreach Committee, 1985 - 1990.
Member of the United Methodist Men
Mentor, Apprenticeships in Science and Engineering, 1994-2000.
Oregon Science Teachers Association, invited presentations at annual meeting, 1995, 1997.

AWARDS

Kiwanian of the Year, 2004, Ontario, Oregon
Briskey Award for Faculty Excellence, College of Agriculture Sciences, OSU, November 2003
Distinguished Service Award, Oregon Potato Commission, January 2003
Excellence in Educational Materials, Malheur Exp. Station Web Site, 2002, American Society of Agronomy.
Certified Professional Horticulturalist, 2002, American Society of Horticultural Science.
Governor's 2001 Spirit of the Oregon Plan Leadership Award (environmental leadership).
Educator of the Year, 2001, Ontario Chamber of Commerce.
Excellence in Educational Materials, Publications over 16 pages, 2001 American Society of Agronomy.
Hall of Fame 1999, Mentor to Apprenticeships in Science and Engineering by the Saturday Academy.
ESCOP/ACOP Leadership Development Program, Certificate of Completion, 1999.
Outstanding and Dedicated Service, Malheur County Farm Bureau, 1998.
Presidential Scoutmaster's Award, 1996.
Silver Beaver, Boy Scouts of America, 1995.
Wood Badge Beads, Boy Scouts of America, 1994 (completion and implementation of advanced leadership training).
Scouters' Key, 1994.
Cubmaster Award, 1993.
Cub Scouter Award, 1992.
Scouters' Training Award, 1992.
Extra Mile Award, Boy Scouts of America, 1988, 1992, 2000.
District Award of Merit, Boy Scouts of America, 1991.
75th Anniversary Award, Order of the Arrow, 1991.
Special Mission Recognition, United Methodist Women. 1991
Founders Award, Order of the Arrow, 1990.
Certificate of Appreciation from Treasure Valley Opportunities, 1986, 1989 and 1990.
Centers of Excellence Award, The Carborundum Company, October 1989.
FFA citation to Malheur Exp. Station for encouragement, cooperation, and assistance. Ontario FFA Chapter, 1988.
Kiwanis Distinguished Service Award, 1983; recognition for service, 1998.
Sigma Xi, 1981
Regents Graduate Fellowship, University of California, 1979-1982.

Earl May Graduate Fellowship, University of California, Davis, 1978-1979.

TEAM AWARDS

Troop 400 recognized for 154 consecutive months of camping, March, 2004.
Environmental Achievement Award to the Malheur Water Quality Initiative from Renew America. 1996 and 1997
Environmental Progress Award to the Malheur Water Quality Initiative from Renew America. 1992.

SUMMARY OF PROFFESSIONAL ACTIVITIES; December 2004

Superintendent and Professor, (1992-present), Malheur Experiment Station, Ontario, Oregon

Administration

Administered Malheur Experiment Station. Was responsible for management of station resources, financial planning, budgets, personnel management, research program stimulation, and public relations.

Led the research program on environmental issues including erosion control, excessive sediment and nutrient losses in surface water runoff, and groundwater contamination with nitrate and Dacthal breakdown products. Effectively participated in several cooperative team efforts to correct environmental problems in the County.

Established capitalization and maintenance priorities. Identified deficiencies and corrected shortcomings in computer systems, irrigation systems, and environmental measurements.

Wrote most of the station web pages that were designed by Cedric Shock. Insured timely web page updates by others.

Obtained $ 650,000 for capital improvements at the station over the last eleven years, increasing the station's ability to address growers' research needs. Supervised detailed design, bidding and construction of capital improvements.

Served the scientific profession as Associate Editor of HortScience and editorial board member of Agricultural Sciences in China.

Cooperated in many team activities including the Western Region Project W-128: Microirrigation: Management Practices to Sustain Water Quality and Agricultural Productivity and the Oregon Potato Variety Development Program.

Fostered cooperation of extension agents in SE Oregon and SW Idaho through the conception and creation of the Treasure Valley Pest Alert Network. The network is being led by Ben Simko of OSU and Jerry Neufeld of UI.

Promoted sustainable agriculture projects and ethics through the Malheur Watershed Council, Owyhee Watershed Council, Northern Malheur County Citizens Groundwater Committee, The Malheur Basin Local Advisory Group (SB1010), Water Quality Interagency Team, and the Snake River TMDL Public Advisory Committee.

Built an Internet web site for identification of local vegetation, “Mid-Snake River Watershed Vegetation Database” for public education. Posted original pictures of over 200 species on this site and made it available to the public in 2004.

Research

Obtained $3,016,200 in support of research over the last thirteen years.

Conducted research with emphasis in three areas: water quality issues (including soil water measurements), product quality, and new crops.

Soil water measurements using GMS were developed. Calibrations of instrument readings made at the Malheur Experiment Station are providing leadership of this technology world wide.

The world's first regular working "PhaseAble™" motor was placed in operation at the station, demonstrating the reality of providing highly efficient three-phase motor operation on single phase power.

Water quality research made progress that was immediately implemented. Erosion control practices with mechanical furrow mulching and polyacrylamide were developed and proven effective. Fertilization and irrigation methods were developed that saved growers N costs, protected profitability, and protected groundwater. Natural soil N-mineralization was discovered to contribute more available-N to the soil-plant environment than previously thought. Growers' N fertilizer costs can be lowered. Environmental N loading can be reduced.

Increased quality of sugar beets by using soil N-mineralization credits for calculating N requirements. Better beets (more sugar, less conductivity) result from lower N fertilizer inputs. Consequently many growers now can use the beet crop in the crop rotation to "sop up" available-N, helping to protect the ground water from nitrate contamination.

Investigated new crops including asparagus, soybeans as a rotation crop, poplars, Hicksii yew for the anti-cancer drug taxol, and other pharmaceuticals. Hicksii yew is now being investigated for biological insecticide content.

Continued grower support trials that include variety and crop quality testing on onions, potatoes, sugarbeets, small grains, and alfalfa.

Demonstrated that onions grown under automated drip irrigation had improved yield and quality. Current work demonstrates the reduction and optimization of N fertilizer inputs with precision drip irrigation.

Developed and implemented research initiatives to extend subsurface drip irrigation research to potatoes, poplars, alfalfa seed, and long term crop rotations involving various crops.

Led the statewide effort to provide growers with real time potato late blight risk predictions for the Klamath Basin, Central Oregon, and the Treasure Valley.

Participated in the international team assessing the environmental vulnerability of the Baia da Ihla Grande, Rio de Janeiro, Brazil. Evaluated erosion around the Ilha Grande Bay. Developed specific recommendations for decreasing the potential for erosion.

Provided international consulting to correct poor growth of poplar tree plantations in the states of Parana and Santa Catarina, Brazil.

Associate Professor and Superintendent (1984-1991), Malheur Experiment Station, Ontario, Oregon.

Administration

Administered Malheur Experiment Station. Was responsible for management of station resources, financial planning, budgets, personnel management, research program stimulation, and public relations.

Instituted long term crop rotation plan, increased special sponsored events at the station, and enhanced station relations with community organizations and news and trade journals.

Established capitalization and maintenance priorities. Identified deficiencies and corrected shortcomings in word processing, data analysis, irrigation systems, harvesting, product handling, storage, laboratory and environmental condition measuring equipment.

Obtained $ 500,000 for capital improvements at the station, increasing the station's ability to address growers' research needs. Supervised detailed design, bidding and construction of capital improvements.

Research

Conducted research with emphasis in three areas: product quality, water stress, and new crops.

Potato tuber quality was related to sprinkler irrigation, delayed onset of irrigation, and water stress coincident with heat stress anytime from mid-June through mid-August. Optimum onion densities maximized yield of jumbo onions. Simulated onion export explored ways to improve quality of onion "arrival" at export markets. Experimental changes increased sugar beet N plant response.

Found crop water stress index (CWSI) negatively related to potato quality and market value. Alfalfa seed yield positively related to CWSI. Using CWSI irrigation criteria can conserve 35 to 53 percent of irrigation water. Watermark soil moisture sensors proved valuable soil water monitoring devices.

New crops investigated included *Artemisia annua*, kabocha and other Japanese squashes, white flowered gourd, Japanese melons, and rotation legume crops (soybeans, lima beans, and berseem clover).

Assistant Professor, Louisiana State Experiment Station, Jeanerette, Louisiana.

Worked on forage legume introduction, cultural practices, and productivity.

Participated in a consulting mission with the IRI Research Institute to the Alto Huallaga region of Peru to examine pasture productivity and potential. Economic alternatives were needed since this is in the heart of the coca growing region.

Research Assistant and **Graduate Student**, University of California, Davis California.

Worked on pasture and range land fertility with special emphasis on sulfur nutrition of forage plants.

Participated in two consulting missions with the IRI Research Institute to the semi-arid Chaco in Paraguay for the United Nations Development Project in Paraguay. Introduced diversified forage species to the Paraguayan Chaco and sought more productive strains of forage, and better means of utilization, establishment, and maintenance.

Collected an *Azolla* selection which has since become the standard used throughout paddy rice growing areas of Asia for nitrogen fixation.

Acting General Manager for Brazil, IRI Research Institute, Matão, São Paulo, Brazil.

Supervised all research and administrative work of the institute in Brazil with a staff of 60 employees.

Led a consulting mission from IRI to Paraguay for the United Nations Development Project to evaluate the economic and agronomic viability for colonization in the Chaco. Evaluated pasture and cattle productivity and developed a program of experimentation installed and managed by the UNDP at La Patria in the Chaco.

Directed final research report on revegetation of infertile acid Amazon subsoils. Wrote section on specie adaptation, soil fertility, and critical minimum levels of soil fertility. Guided publication of a practical operations manual for the revegetation of disturbed sites in the Amazon. Practices provided adequate cover and controlled erosion.

Manager and **Superintendent**, Experimental Farm and Training Center, IRI Research Institute, Matão, São Paulo, Brazil.

Administered the experimental farm. Supervised all commercial seed production activities and training courses with a staff of over 20 personnel on 52 hectares.

Organized and supervised the collection and identification of over 700 new accessions for IRI's grass and legume collection, now containing 2600 accessions. Directed evaluation of collection for forage and revegetation research.

Planned, installed, and evaluated erosion and revegetation research trials in the Amazon basin. Discovered revegetation methods, specie adaptation, soil fertility, and critical minimum levels of soil fertility for infertile acid Amazon subsoils. Revegetated areas remain with adequate cover through the present.

Initiated, planned and directed all experiments including selection of three soybean cultivars for commercial seed production, evaluation of *Centrosema* cultivars for low fertility soils, and collection, classification and testing of the persistent, rapid-establishing species *Homolepsis aturensis* as one of the most promising grasses for roadside revegetation on high aluminum, low fertility Amazon subsoils.

Characterized previously ill-defined soil structure and fertility problems and implemented corrective measures on the experimental farm, turning 20 hectares of formerly marginal into productive land.

Directed and helped teach courses in beef production and agricultural statistics.

Advised ranchers and farmers as to the most suitable forages for their areas and the correction of soil nutrient deficiencies.

Evaluated pasture potential in the derived guinea savanna of Nigeria as a short term consultant. Developed specific recommendations for making unproductive land highly efficient improved pasture. Consulted for projects in Venezuela, Paraguay and Brazil.

Self-employed, Pedro Juan Caballero, Paraguay.

Administered over 450 hectares of coffee and soybeans. The historic July 1975 frost killed the coffee trees.

Project Leader, IRI Research Institute, IRI-DERSA Roadside Revegetation Project, São Paulo - Santos Immigrants' Highway, São Paulo, SP, Brazil.

Developed cost-effective cultural, fertilization, and planting practices for revegetation of infertile subsoil on cut and fill slopes in the Atlantic Coastal forest ("Serra do Mar"), including selection of cultivars, determination of optimum fertilization, and adaptation of mechanical methods to Brazilian conditions and equipment. Practices provided adequate cover and controlled erosion. Revegetated areas remain with adequate cover through the present, evolving into coastal rain forest.

Collected, classified and evaluated native grasses and legumes.

Principal author of the first comprehensive roadside revegetation and erosion control manual written in Brazil.

Laboratory Technician, Soil Chemistry Laboratory, Department of Pomology, University of California, Davis, California.

Part-time research on soil cation relationships during M.S. degree study.

Agricultural Extension Agent, Glória de Dourados, Mato Grosso do Sul, Brazil. (Under the auspices of the Board of Missions of the United Methodist Church, New York, NY.)

Introduced cultural and fertilization practices and improvements to small farmers growing cotton, peanuts, upland rice, corn, soybeans, coffee, dry beans, and home garden and orchard crops resulting in increased crop yields.

Introduced and tested 300 cultivars of various crops and vegetables for adaptation to the local climate. One rice cultivar replaced all other cultivars' acreage within three years of the original introduction.

Wrote plans for and administered crop production loans for farmers as part of a cooperative rural credit program. This program demonstrated that poor would repay loans, helping to facilitate the expansion of free market farming and modern bank loans into a region previously controlled by middlemen who had charged exorbitant prices, paid poorly for growers commodities, and charged monthly interest rates of 10 to 12 percent per month.

Advised the local agricultural cooperative with respect to obtaining fertilizer, lime, and pesticide inputs for less and selling of its produce for more.