

2005 RPES Outline for Area Review: \*First 3 pages\*

**Factor I - Research Assignment**

A. Assigned Responsibility

Must have this: The incumbent is a Lead Scientist for the National Program (NP) 202 CRIS entitled 'Soil Quality Assessment, Discernment, and Management' at the National Soil Tilth Laboratory (NSTL).

B. Research Objectives and Methodology

C. Expected Results

D. Knowledge Required

E. Supervisory Responsibilities

Must have this statement included: \*

Incumbent outlines work assignments, provides guidance on procedures and methods to be employed, and reviews work in progress. Incumbent is responsible for approving or disapproving leave, giving performance evaluations, and making recommendations concerning personnel actions. Assures that equal opportunity is extended to all employees supervised, which includes full consideration of eligible minority group members and women in filling vacant positions; holding individual and group meetings to communicate equal employment opportunities and program missions; providing career counseling and orientation; enhancing career development opportunities through training and development, job redesign, and similar techniques; and ensuring full and equal consideration of these employees in recommending promotions, awards, and other forms of special recognition.

**Factor II - Supervision Received**

A. Assigned Authority

B. Technical Guidance Received

C. Review of Results

D. General Supervision

**Factor III - Guidelines and Originality**

A. Available Literature

B. Originality Required

**Must start a new Page:**  
**Factor III - Guidelines and Originality**

C. Demonstrated Originality

**Factor IV - Qualifications and Contributions**

A. Demonstrated Accomplishments

1. **Accomplishment:** High corn yields required to meet grain needs for increasing poultry and swine production in the southeastern Coastal Plain were achieved by integrating in-row tillage, fertilizer and water management, and twin-row planting configurations into a more complete production system. Principles of agronomy, plant physiology, soil fertility, plant nutrition, water management, and engineering were integrated using a systems approach to increase grain yield without forcing producers to change all of their equipment. **Role:** Dr. Karlen recognized that for higher grain yield, increased plant productivity per unit area was needed. Decreasing row spacing was not possible because of conflicts with equipment needed for other farming system operations (*i.e.*, cotton). Dr. Karlen provided leadership for a research team, with his personal efforts focused on soil fertility, plant nutrition, and row configuration. Other members included an agricultural engineer, plant physiologist, and microclimatologist for tillage, phytochrome, and water use components, respectively. He also partnered with Cooperative Extension Service colleagues to transfer the technology and insight associated with the “twin-row” production system. **Impact:** The twin-row system doubled local corn grain yields and increased silage yields by 40% without reducing crop quality or requiring excessive rates of N-P-K fertilizer. Better understanding of phytochrome regulation enabled the team to explain corn hybrid responses to row spacing, configuration, and orientation. Twin-row planters for corn, cotton, soybean, peanut, rice, and vegetables are currently manufactured by Monosem and are being used in several states. (Exhibit 1a, #24; Exhibit 1b, #41; and #22, #23, #25, #27, #31, #33, #34, #36, #43, #66, #71, #141, #142, #145, #146, and #147)

\*2. **Accomplishment:**

\*3. **Accomplishment:**

\*4. **Accomplishment:**

5. **Accomplishment:** Up to 8 accomplishments

Additional Accomplishments

Only 2 allowed.

**Accomplishment: Role: Impact:** (#30, #35, #50, and #51)

## B. Stature and Recognition

### 1. Honors and Awards

Dr. Karlen has received 18 formal honors and awards during his career. They are:

- American Society of Agronomy, Outstanding Senior at the University of Wisconsin-Madison, 1973
- Sigma-Xi, 1977
- Gamma Sigma Delta, 1992
- Who's Who in Science and Engineering, 1992
- Who's Who in America, 1993
- Fellow, American Society of Agronomy, 1992
- Fellow, Crop Science Society of America, 1993
- Fellow, Soil Science Society of America, 1994

### 2. Special Invitations

Dr. Karlen has had more than 70 prestigious invitations to write reviews, edit books and journals, and make presentations at conferences in Brazil, Canada, England, India, Japan, Korea, the Netherlands, Norway, and the United States addressing soil, crop, agronomy, sociology, and other aspects of agricultural systems. The following are representative of his international, interdisciplinary recognition.

- Invited to review "Conservation Tillage Research Findings and Needs in the East and Midwest" at the National Association of Conservation Districts (NACD) Annual Meeting, Salt Lake City, UT, 1989 (#48).
- Invited by the Executive Editor of CRC Press, Inc. to co-edit the book Sustainable Agriculture Systems and to prepare a review chapter entitled "Management Strategies for Sustainable Soil Fertility," 1989 (#169, #170).

### 3. Offices and Committee Assignments in Professional and Honorary Societies

- Associate Editor, Division C3, Crop Ecology, Production, & Management, Crop Science, 1988-1993.
- Co-chair for a symposium entitled "Management Systems I. Sustaining the Soil Resource" for the First International Crop Science Congress, Ames, IA., 1992.

### 4. Participation in Professional Meetings, Technical Conferences, Workshops, etc.

- American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA), (1972 to present). Attended 37 meetings and made 40 presentations.
- Soil and Water Conservation Society (SWCS), (1982-present). Attended 4 annual meetings and made 4 presentations.
- International Soil and Tillage Research Organization (ISTRO), (1992-present). Attended 1 meeting, organized pre-conference tour, and made 2 presentations.

## C. Advisory and Consultant Activities

### 1. Professional Advisory and Consulting Activities

Dr Karlen is internationally recognized for his agronomy, crop science, and soil science expertise and is frequently invited to share his insight through many different venues within and outside his specific areas of training. This includes:

- Serving as an invited reviewer for at least 15 journals averaging 20 requests per year.
- Reviewing research proposals for the Binational Agricultural Research and Development (BARD) fund, 1989-present.
- Reviewing research proposals for the USDA National Research Initiative (NRI), 1993-present.

### 2. Special Assignments

Dr. Karlen has frequently taken on special assignments to assist ARS Area and National Program Leaders as well as his professional societies, ASA-CSSA-SSSA and the SWCS. Selected examples include:

- Serving as authorized departmental officer's designated representative (ADODR) for 5 different ARS projects, 1981-1996.
- Developing a plan for conducting Integrated Farm Management Systems (IFMS) research in response to a joint proposal between the USDA-ARS and the US-EPA, 1992.

## D. Other

### 1. Educational Background

1969-1973 – University of Wisconsin-Madison; major, Soil Science; B.S.  
1973

### 2. Research Experience

1981-1985, GS-12, Soil Scientist, Coastal Plains Soil and Water Conservation Research Center, Florence, SC

### 3. Other Significant Information

- Dr. Karlen is a full Professor/USDA Collaborator and member of the Graduate Faculty at Iowa State University, Ames, IA. He has served as major advisor for 3 Ph.D. and 5 M.S. candidates, and has served or is serving on advisory committees for 15 students in Agronomy, Agricultural and Bio-systems Engineering, Entomology, and Microbiology Departments.
- Dr. Karlen also has an adjunct appointment with Clemson University Department of Entomology, Soils and Plant Sciences.
- Manuscripts submitted for journal review but not yet accepted.
  - **Karlen, D. L.**, Dinnes, D. L., Jaynes, D. B., Hurburgh, C. R., Cambardella, C. A., Colvin, T. S., and Rippke, G. R. Corn crop response to watershed implementation of the late spring nitrate test. Submitted to Agronomy J. (June 2004).
- Grants and Cooperative Research Agreements  
Dr. Karlen has been “principle investigator” (PI) or co-PI for more than 20 grants and cooperative research agreements. Among the most significant are:
  - Soil Quality Indicators for the U.S. Northern Corn Belt. 11/92 – 08/96 with North Dakota State University (\$105,000)
  - Soil Quality Indicator for Tropical Soils. 08/93 – 07/97 with US-AID Sustainable Agriculture and Natural Resource Management (SANREM) project (\$10,620)

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E. Publications

**Peer-Reviewed Journal Publications**

1. **Karlen, D. L.**, Arny, D. and Walsh, L. M. Incidence of chocolate spot (*Pseudomonas syringae*), northern corn leaf blight (*Helminthosporium turcicum*), and lodging of corn as influenced by soil fertility. *Comm. Soil Sci. Plant Anal.* 4(5):359-368. 1973.
  2. **Karlen, D. L.**, Vitosh, M. L. and Kunze, R. J. Irrigation of corn with simulated municipal sewage effluent. *J. Environ. Qual.* 5:269-273. 1976.
  3. **Karlen, D. L.**, Whitney, D. A. and Ellis, R., Jr. Nutrient availability, plant growth, and composition as influenced by liming an acid Marshall silt loam. *Trans. Kansas Acad. Sci.* 80:129-135. 1977.
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4. Thien, S. J., Whitney, D. A., and **Karlen, D. L.** Effect of microwave radiation drying on soil chemical and mineralogical analysis. *Comm. Soil Sci. Plant Anal.* 9(3):231-241. 1978.

**Other Publications**