

PURPOSE

The intent of this project is to facilitate NRCS conservation planning across a broad range of resource concerns based on state of the science information. When completed, this system will allow producers to enhance their agricultural planning by giving them a logical framework for decision making based on documented science. The project integrates field observations from the Nashua MSEA location, the RZWQM simulation model, expert review of the results, and a web-based decision support system. The NRCS will be able to provide this improved information without painstaking efforts to simulate each field on their own once a quality assured database has been populated.

DESCRIPTION

Our work focuses on the implementation of a web application that will facilitate the decision making process for producers and soil conservationists in the Midwest.

The CPSS has been designed to satisfy the following:

- 1.) To facilitate the decision making process for producers by incorporating information on sustainability, offsite effects, and profitability.
- 2.) To support the NRCS Conservation Planning Process by automation and providing tools to help soil conservationists explain how management changes affect the natural system's production, sustainability, and water quality.

We are focusing on Phase II (steps 5,6,and 7) of the NRCS Conservation Planning Process. Here is a summary of the NRCS Conservation Planning Process:

Phase I - Collection and Analysis (Understanding the Problems and Opportunities)

- 1) Identify Problems and Opportunities
- 2) Determine Objectives
- 3) Inventory Resources
- 4) Analyze Resource Data

Phase II - Decision Support (Understanding the Solutions)

- 1) Formulate Alternatives
- 2) Evaluate Alternatives
- 3) Make Decisions

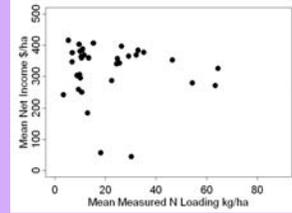
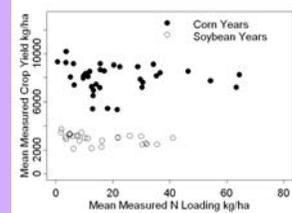
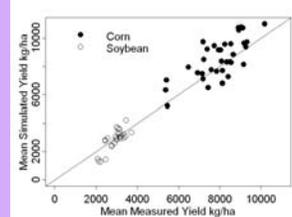
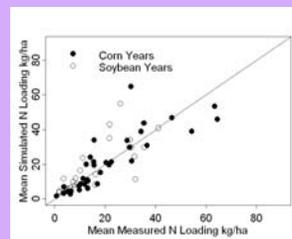
Phase III - Application and Evaluation (Understanding the Results)

- 1) Implement the Plan
- 2) Evaluate the Plan



35 Management Treatments Studied at the Nashua, Iowa Site from 1990-2003

Treatment	Tillage	Rotation	N Form	N Application/Method	Years
1	NT	CC	Anhydrous		90-92
2	NT	CS	Anhydrous		90-93
3	NT	SC	Anhydrous		90-92
4	CP	SC	Anhydrous		90-92
5	CP	CS	Anhydrous		90-93
6	CP	SC	Anhydrous		90-92
7	MP	CC	Anhydrous		90-92
8	MP	CS	Anhydrous		90-92
9	MP	SC	Anhydrous		90-92
10	RT	CC	Anhydrous		90-92
11	RT	CS	Anhydrous		90-92
12	RT	SC	Anhydrous		90-92
13	NT	CS	Urea Ammonium Nitrate	Late Spring Nitrate Test	94-98
14	NT	SC	Urea Ammonium Nitrate	Late Spring Nitrate Test	93-00
15	CP	CS	Urea Ammonium Nitrate	Late Spring Nitrate Test	94-99
16	CP	SC	Urea Ammonium Nitrate	Late Spring Nitrate Test	93-00
17	NT	CS	Urea Ammonium Nitrate	Spring Pre-plant	94-99
18	NT	SC	Urea Ammonium Nitrate	Spring Pre-plant	94-99
19	CP	CS	Urea Ammonium Nitrate	Spring Pre-plant	93-98
20	CP	SC	Urea Ammonium Nitrate	Spring Pre-plant	94-03
21	CP	SC	Urea Ammonium Nitrate	Spring Pre-plant	93-03
22	CP	CS	Urea Ammonium Nitrate	Split Localized Compaction and Doming	00-03
23	CP	SC	Urea Ammonium Nitrate	Split Localized Compaction and Doming	01-03
24	CP	SC	Swine Manure	Fall	93-98
25	CP	CS	Swine Manure	Fall	94-03
26	CP	SC	Swine Manure	Fall	93-03
27	CP	SC	Urea Ammonium Nitrate	Fall Spring	99
28	CP	CS	Urea Ammonium Nitrate	Fall Spring	00-03
29	CP	SC	Swine Manure	Fall	00-03
30	CP	CC	Urea Ammonium Nitrate	Spring	00-03
31	CP	CS	Swine Manure on both Corn and Beans	Fall	00
32	CP	SC	Swine Manure on both Corn and Beans	Fall	01-03
33	NT	CS	Swine Manure	Spring Preplant	00-03
34	NT	SC	Swine Manure	Spring Preplant	01-03
35	CP	CS	Swine Manure	Spring Preplant	99-00



ACCOMPLISHMENTS

- Development of an extensive database of water quality measurements for the MSEA – Iowa State University Nashua Field Station
- Extensive calibration and simulation efforts using the RZWQM model with the Nashua dataset
- Completed design documents for the CPSS
- Created RDBMS to hold all simulated and observed data
- Completed CPPE Tool for step 5 of the planning process
- Created graphics package to be used in step 6 of planning process
- Created budgets in the NRCS EconDocs Program for the management systems studied at Nashua
- Initiated development of web-based delivery of step 7 based on the Facilitator, and existing desktop multiobjective DSS

IMPACT

Still a work in progress, the project will provide a model for an integrated approach to improving the science used for conservation planning. The approach will require some adjustments from current practice, but if databases can be populated, conservationists can work with producers across a broad range of resource concerns without the time-consuming requirements of simulation model parameterization.

The project also demonstrates cooperation across a number of ARS locations, notably the National Soil Tillage Laboratory in Ames, Iowa with expertise in modeling and field data on water quality issues, the Great Plains Systems Research Unit in Fort Collins, Colorado, with expertise in the Root Zone Water Quality Model and systems analysis, and the Southwest Watershed Research Center, with expertise in Economics and Decision Support Systems. The NRCS collaborators include the Iowa NRCS State Office, the NRCS Information Technology Center in Fort Collins, CO, and the West Regional Technical Center in Portland, Oregon.