Welcome to Manure Du Jour – Season II
Serving Pennsylvania’s Best Practices for Animal Ag-, Air- and Water Quality Protection

Decision Support Tools – Using GIS for Environmental Adaptive Management

SPEAKER: Dr. Rick Day
Penn State Crop and Soil Sciences and the Land Analysis Lab

Moderator: Robb Meinen
Penn State Dairy & Animal Sciences
2010 Manure Expo
Balancing Production and Conservation

Thursday, July 15
Ag Progress Days Fairgrounds
Pennsylvania Furnace, PA

http://das.psu.edu/manure-expo
ManureExpop@psu.edu; (814) 863-2873
Robb Meinen, Expo Chair, rjm134@psu.edu
3 goals

The Expo combines 3 attractions into 1 event.

1. Industry trade show.
2. Manure technology demonstrations.
3. Educational events.
All-star Agenda

- **Expert presenters from 8 states & Washington DC.**
- 27 presenters
- 18 sessions
- 4 demonstrations
- >60 exhibitors (anticipated)
2010 Manure Expo – Agenda

- Manure application in...
  - No-till
  - Alfalfa/Legumes
  - Cover Crops
- Winter application
- Spreader calibration
- Manure application odor
- Soil compaction
- Regulations/Ches Bay policy
- Nutrient trading & innovative community projects
More Agenda

- In-house poultry litter mgmt
- In-field storage of manure
- Manure mgmt & flies
- Using dairy solids as bedding
- Alternative treatments of manure
- Mortality composting
- Spill response & safety
- Tours & more…
  - Soil Pit
  - Sinkhole tour
- PA One Stop workshops
2010 Manure Expo
Balancing Production and Conservation

Please “spread” the word.
Please attend.

July 15, 2010
Ag Progress Days site

Please visit our website:
http://das.psu.edu/manure-expo

Robb Meinen
(814) 865 – 5986
rjm134@psu.edu
PaOneStop : Online Conservation and Nutrient Planning System

Rick L. Day, Ph.D.
Penn State University
RGIS – Chesapeake Penn State
PaOneStop (www.PaOneStop.org)

- Pa One Stop provides online tools to help farmers meet regulatory requirements for Conservation and Nutrient Management Planning
- Consists of two modules:
  - **Nutrient Management Planning Mapping Module** – allows farmers to develop maps that are required for Nutrient Management Planning and completion of Nutrient Balance Sheets
  - **Conservation Planning Module** – allows farmers to develop Conservation Plans to reduce soil loss and protect water quality
- Development of Pa One Stop is ongoing and will be released to the public incrementally. A pilot version of the Nutrient Management Planning Mapping Module has been released.
Cooperators

- Pa State Conservation Commission
- Pa Department of Agriculture
- Pa Department of Environmental Protection
- Pa Office of USDA-NRCS
- Penn State Cooperative Extension
- National Consortium for Rural Geospatial Innovations – Chesapeake Penn State site – funded by USDA-NIFA
Nutrient Management Mapping

- Pa regulations require completion of Nutrient Balance Sheets for manure transfers to protect water quality.
- Pa State Conservation Commission estimates that more than 50,000 nutrient balance sheets are completed annually.
- Methods to develop Nutrient Balance Sheets are available to farmers but require maps as part of the process.
- Maps are expected to contain field boundaries, acreages, stream and water features, wells, sinkholes, application setbacks and buffers, soils, aerial images and more.
- Production of maps is difficult for most farmers.
Create User Login

- Username
- Password
- Data secured and not shared
- Data stored on server for future access and editing
- Four easy steps!!
Step 1: Locate Farm

- Locate farm using address and Google maps
- Map as many farms as you like
Step 2: Draw and Label Fields

Outline field boundaries
Assign field identification number
Describe fields
Acreages automatically calculated
Fields can be added, edited, or deleted as needed.
Air photo background automatically provided
Edit Fields

Field boundaries can be edited and resaved

Errors can be deleted
Step 3: Draw Farm Features

Draw other farm features needed for map:
- water wells
- sinkholes
- streams
- manure staging areas

Generate manure setback areas
Generate stream buffers
Step 4: Create Map

Select features to appear on map

Only impacted fields need to be mapped

Hide any field or feature not needed for map

Select background for map

- air photo
- topography
Generate Digital or Hardcopy Maps

FarmMap generates a map that is acceptable for PA Nutrient Balance Sheet submission

Farmers can save maps for reference

Farmers can save farm data for future mapping

Only need to draw fields and farm features once
Generate Custom Maps

Hide Features not needed for map
Features only need to be digitized once
Saves time
Account: Edit / Delete Farms

User can add, edit, delete, listings as needed

User can have one or many listings
Benefits to Farmers

- Generate high-quality maps on aerial imagery
- No specialized software needed
- Farm information can be saved online for future usage
- Farm only needs to be drawn once
- Field acreages automatically calculated
- Helps meet regulatory requirements designed to protect PA water resources
Status

- Presentations to two manure broker meetings
- Beta testing ongoing
- Available for testing by public
- Developing Help and educational materials
- Presentations to user groups – Manure Expo etc.
- Feedback providing valuable improvements
  - Holes in fields
  - All fields on/off
  - Multiple buffers displayed
  - Land within buffer and setbacks
Conservation Planning Module

- **Purpose:** reduce soil loss and protect water quality

- **Problem:**
  - 59,000 Pa farms approximately
  - 40,000 without current Conservation Plans to meet DEP Chapter 102 compliance
  - Current rate of plan development much too slow
  - Farmers not actively involved – done by USDA-NRCS
  - PaOneStop will increase the rate of plan development and bring farms into regulatory compliance
How will it work?

- Digitize field boundaries
- Collect farm management information from farmer (tillage, crops etc)
- Extract soil, terrain, climatic conditions from online GIS servers
- Determine soil loss for each field (RUSLE/RUSLE2 model)
  - \( A = R \times K \times LS \times C \times P \)
- Compare soil loss to NRCS tolerable soil loss values (T)
- Modify crop management and/or implement conservation practices necessary to achieve tolerable soil loss for each field.
- Store farm information online for future modification or access
- Print reports and maps summarizing the Conservation Plan
- Submit Conservation Plan to regulatory agencies for review
Field Characterization - Soils

- Soils
- USDA-NRCS
- K-factor
Field Characterization - Topography

LiDAR data
Terrain Models
- Slope
- Slope Length
Benefits

- Actively engage farmers in conservation planning
- Efficient production of Conservation Plans
- Meet Chapter 102 compliance standards
- Simplify plan updates
- Evaluate various management scenarios
- Reduce soil loss
- Improve water quality
- Provide valuable database of agricultural management and conservation practices statewide
Status

- Startup funding available – more needed
- Advisory Committee established
- Technical development stage currently
- Final prototype within 1 – 1.5 years
- Long-term enhancements needed along with education and training programs
DEMO

www.PaOneStop.org
Question and Answers

• Recordings of this session will be posted at
  www.aec.cas.psu.edu
What’s ahead for season II?

• Wed, Jun 9 – 1:30 to 2:30 PM
  – Dr. Peter Landschoot, Professor of Turfgrass Management on Turf Management in the Chesapeake Bay

• Full schedule for the Manure du jour program: http://aec.cas.psu.edu
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