AgWG Meeting
NutMan 4.0

Status Update
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December 2013

NutMan Project Background

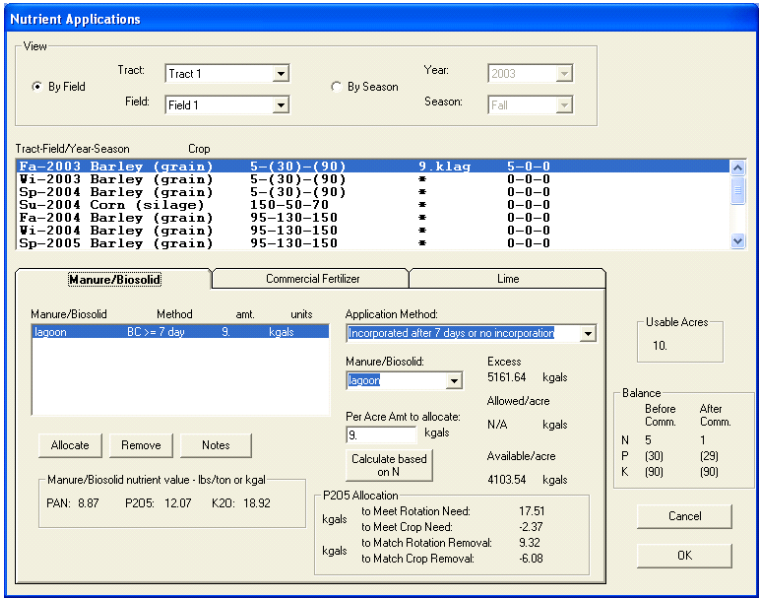
- NutMan was developed in the late 1990's to help VA DCR develop Nutrient Management Plans
- Spin-off from a whole-farm planning system developed at Virginia Tech
- Simple concept:
  - Help Nutrient Management Specialists write plans in accordance with Virginia Standards & Criteria
  - Provide a means to expand the number of planners

NutMan Background, cont'd

- NutMan 2.0 was a PC-based program
  - Plans were files shared on disk or by email
  - Program reporting depended on…
    - Individual planners generating reports
    - Collecting and combining reports centrally
- PC laptop delivery system
  - Easy to share and deliver on disk or via web
  - Hard to upgrade in a coordinated way
  - Difficult to track planning activity

NutMan Background, cont'd

- Initially purely voluntary program
- By the 2000's
  - Increased complexity
  - Increased regulation
  - Increased importance of quality control
  - Increased emphasis on reporting
  - Dependence on spatial information



Tract: tract1 Location: Montgomery

(N = N based, 1P = P based, 1.5P = P based at 1.5 removal, 0P = P removal ignored)

Field CFSA No. /Name	Size (ac) Total/ Used	Yr.	Crop	Needs N-P-K (lbs/ac)	Leg /Man Resid	Manure/Biosld Rate & Type (season)	IT (d)	Man/Bios N-P-K (lbs/ac)	Net = Needs - appld N-P-K (lbs/ac)	Sum P rem cred	Commercial N-P-K (lbs/ac)	Notes
1/field1(1P)	7/7	2005	Corn (grain)	130-120-120	0/0	10 k dairy(Sp)	>7	66-108-192	65-10-(70)	50	65-10-0(td)	
			Rye (cover)	0-0-0	0/0				0-0-(70)	50		
		2006	Corn (grain)	130-120-120	0/15	10 k dairy(Sp)	>7	66-108-192	50-10-(140)	99	50-10-0(td)	
			Rye (cover)	0-0-0	0/0				0-0-(140)	99		

Commercial Application Methods:

br - Broadcast ba - Banded sd - Sidedress

Notes:

NutMan 4 Project

- Overall Goals:
  - Improve centralized reporting capability, security
  - Work toward NEIEN compliance
  - Retain backward compatibility with earlier versions
- Solution: Client-Server Model for NutMan
  - Planning on the Client
  - Reporting on the Server
- Big Changes:
  - NutMan files go away → web services replace email
  - Web-based reporting and coordination
  - GIS/Map integration

NutMan 4 Project

- Limited Changes for Planners
  - Planners won't have to learn a new system
  - Planning process largely unaffected
- Incremental Process
  - Mapping integration opens doors for improvements
  - Web-based, client-server model opens doors for app-based approaches

Client-Server Model

- The Client = NutMan 3.5 with some changes
  - "Plan" menu replaces the "File" menu ☑
  - Plan lists replace File Directories on the PC ☑
  - NutMan will connect to the Server by the Internet ☑
  - Some data entry changes to structure data better ?
- The Server is Web-based and New
  - RDBM System includes Plans, VALUES, Standards ☑
  - Source for future Program Updates, including Soils
    - Client automatically downloads changed DB tables ☑
    - Behind-the-scenes updating of Standards and Criteria ☒

Changes/Benefits/Costs

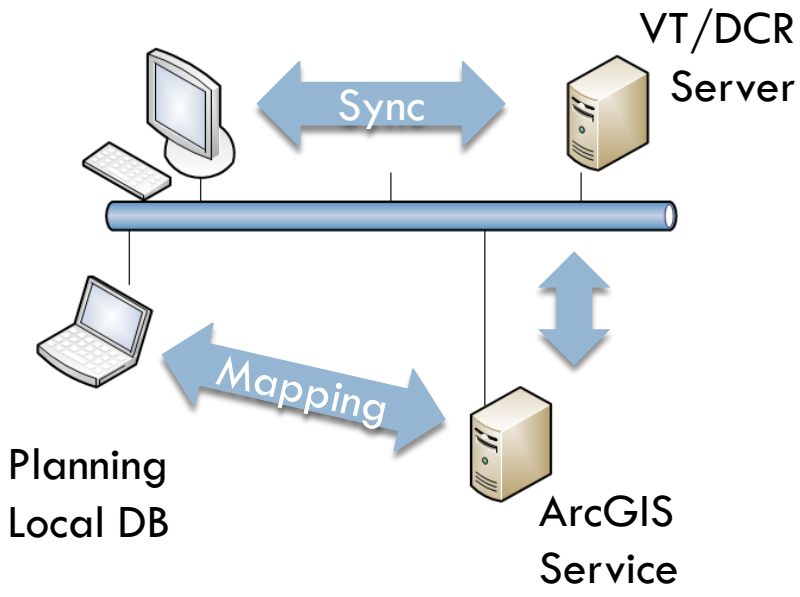
- Synchronization Requirements
  - Plans must be uniquely identified across Virginia ☑
  - Functionality when there is no connection to the server⁉
  - Viewing appropriate data by role ☑
- Synchronization Benefits
  - Web access to plan information for Planners and Administrators ☑
  - Real time record keeping ☑
  - Central record of each plan's history (submission, review, revision, approval, etc.) ☑

New Database Structure

- Relational data model for NutMan plan data added 40 tables to the VALUES soils data and manure/biosolid information – now 111 tables
- All accessible to SQL queries, but not an enterprise database system. Maybe a BI solution is in DCR's future

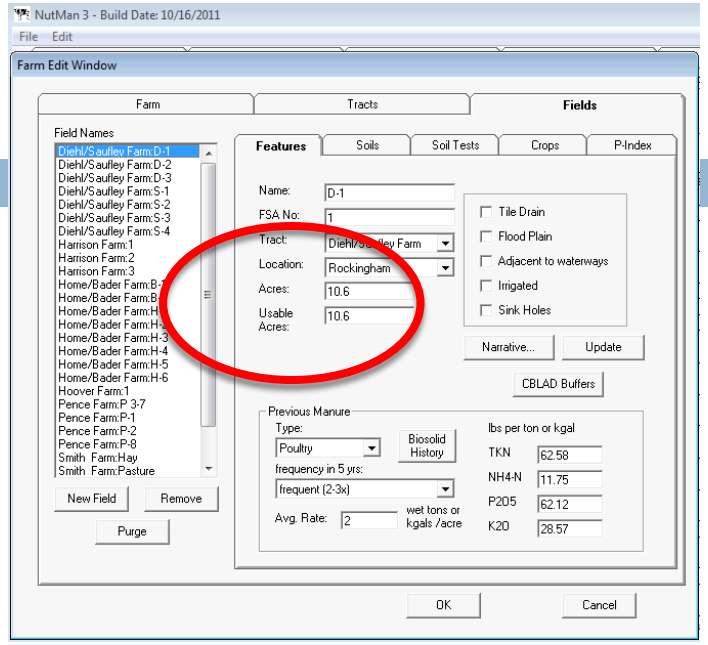
Communications Structure

- Use Web Services
  - SOAP & WSDL
  - Handles Authentication, Synchronization, Communication, Plan services, Table services
- Servers & Services
  - LAMP (Linux, Apache2,…)
  - ArcGIS 10.1
  - Redundant Servers
    - Development
    - Production



GIS Integration

- Field Mapping
  - Window within NutMan client connects to ArcGIS ☑
  - Launched from Edit Field Features Tab ☑
  - Polygon returned and stored with plan ?
  - Field location, soils, acreage, from map ☑ ?
- Plan Duplication Check
  - Server maintains map of all fields in active plans ☑
- Mapping Services on Web



Status

- System Components all Functional
  - Incremental changes still occurring ?
  - Web Services Completed to Design 1.0 ☑ ?
  - Central Database is implemented ☑
- Secure Web Access☑
- Functionality from NutMan client to Web Server is being tested ☑ ?
- GIS Mapping service developed in Blacksburg
  - Mirrored on Development GIS Server in NVa ?