Extension Toolbox

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The Agricultural Nutrient Management Program provides outreach, training opportunities and technical support to the following audiences:

- certified nutrient management consultants
- certified farm operators
- farmers
Programs the Agricultural Nutrient Management Program Provides

Outreach and Training
- agronomy meetings
- certification exam preparation (2 days)
- Farmer Training and Certification (2 days)
- continuing education
  - lectures
  - experiential learning
- plan writing workshops

Technical Support
- assistance with nutrient management planning software

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Modes of Delivery

- lectures
- demonstrations
- field days
- experiential learning
- videos
- web conferences
- website
Lectures

- disadvantages
- advantages

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Lectures/Formal Instruction

• disadvantages
  – limits to human endurance
    • limits to attentiveness
    • limits to comprehension
    • limits to remembering
    • 8 (4)/90/20 (Bob Pike)

• advantages
  – efficient
  – familiar
Ammonia Volatilization

- $\text{NH}_4^+ + \text{OH}^- \rightarrow \text{NH}_3 + \text{H}_2\text{O}$

- Loss pathway for N when ammonium-rich materials are left on soil surface
Ammonia Losses from Manure: A Problem!

- economic loss
  - requires replacement with fertilizer

- environmental impact to natural systems
  - re-deposition of ammonia contributes to acidification of natural ecosystems

- \( \text{NH}_3 \) aerosols form fine particulates
  - PM 2.5
  - leads to poor air quality, e.g. regional haze, respiratory ailments
Getting the Message Out

• facts

– many farmers surface-apply manure
  • use no-till to reduce soil erosion
  • leads to ammonia volatilization

– society and the environmental community believe farmers need to manage manure to reduce ammonia losses
Getting the Message Out

• solution
  – equipment manufacturers have developed new equipment that incorporates manure without destroying residue cover
  – financial assistance is available to use new equipment
  – interest was lacking
Let’s have a field day!

- massive outreach
- a willing host and a good location
Three-Pronged Approach

- ammonia volatilization reduction demo
- equipment demo
- formal instruction (lecture)
Demonstration

manure with and without residue cover

pulling air from headspace through Draeger tube
Dr. Becker explaining results

Left: ammonia loss when manure is covered with residue

Right: manure with no residue

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Minimum-disturbance Incorporation
Minimum-disturbance Incorporation
Lunch and Lecture

Problem: Ammonia Losses Are

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Time to Mingle and Look at Equipment
Experiential Learning

- follow a procedure
  - clear directions
  - opportunity to practice with oversight and feedback

- use equipment properly
  - calibrate application equipment
In-season Soil Nitrate test
reflectomoter and nitrate-sensitive strips

look for the meniscus!
Plant Tissue Testing

- basis of nutrient recommendations for perennial fruit crops
- new concept for most agriculture advisors
- very specific time and location of sampling

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Calibrating Manure Spreaders
determining spreader volume
(an exercise in solid geometry)
1) determining the density of the manure

2) volume \times density = weight

investigating spread pattern
locate collection surfaces on the second pass and collect and weigh after the third pass
Calibration Video

- video
  - http://www.extension.org/preview/pages/Calibrating_Solid_Manure_Application_Equipment#Video
Software Practicum

Practice is essential!

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What is Soil?

- the outer layer of the Earth’s crust (geologists)
- the ecstatic skin of the Earth (William Logan)
- the living skin of the Earth (Ian Pepper)
- crucible of terrestrial life (Daniel Hillel, soil physicist)
- the pedosphere
  - the interface between the lithosphere, hydrosphere and atmosphere (ecologists)
Web Site

Agricultural Nutrient Management Program

The University of Maryland Extension’s Agricultural Nutrient Management Program, which is a component of the University of Maryland’s College of Agriculture and Natural Resources, focuses on reducing the pollution of the Chesapeake Bay by plant nutrients from cropland.

The Agricultural Nutrient Management Program is funded by the Maryland Department of Agriculture.

For more information, contact Trish Steinhilber

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Web Site

- resource for plan developers
- archive of presentations from meetings and trainings (pdf)
- library of presentations for use of ag educators
- FAQ
- calendar of upcoming events
Farmer Networks

• 6 - 8 farmers & 1 technical specialist
• meet several times a year
• assess practices on each farm
• try new practices
• on-farm research is designed for statistical analysis
• share results with group/learn from the collective experience
• build a community of learners
the On-Farm Network

Affiliated Programs

Bay Farms On-Farm Network®
ISA On-Farm Network®
North Carolina On-Farm Network®
Maumee On-Farm Network®
Illinois On-Farm Network®
Indiana On-Farm Network®
Minnesota On-Farm Network®

Newsletters

May 6, 2011
April 6, 2011
March 16, 2011
February 2, 2011
January 19, 2011
January 5, 2011
December 15, 2010
December 1, 2010
Text Messages

• many farmers have cell phones

• important alerts can be sent from one’s computer
  – pest outbreak
  – disease updates

• text messages to hundreds of receivers can be sent from a computer
  – phonenumber@providercode.com
Lots of Tools
(JOE, June 2010, v. 48)

• Which do farmers like?
  – hands-on (99%)
  – demonstrations (96%)
  – farm visits (95%)
  – field days (88%)

• Which do farmers not like?
  – games (20%)
  – role playing (20%)
Ambivalence

- on-line
- websites
- newsletters
- books and manuals
- meetings
- lectures
The Challenge of Choosing the Correct Tool

- **know:**
  - yourself
  - your audience
  - your material

- adapt to the knowledge type

- Make this your mantra – “What my listeners hear, understand and retain is more important than how much info I convey.”
Discussion
Lecture + Active Learning

• integrate active learning techniques into lectures
  – discussion time
  – buzz groups
  – brainstorming
  – mini-quiz (clickers)

• changes the pace/sets the attention clock back to zero
Few Lingering Thought on Lectures

• have a beginning
  – just because they are sitting in the room doesn’t mean they are ready to listen and learn
  • grab their attention
  • tell a joke or story
  • use a quote
  • refer to a previous speaker

• change pace every 8-10 minutes

• assist in the building of cognitive maps

• have an ending
  – don’t just stop talking
  • ask for main ideas
  • pose a question