



Integrated Nitrogen Committee

9-11 April 2008

Remarks by
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Soil and Water Conservation Society



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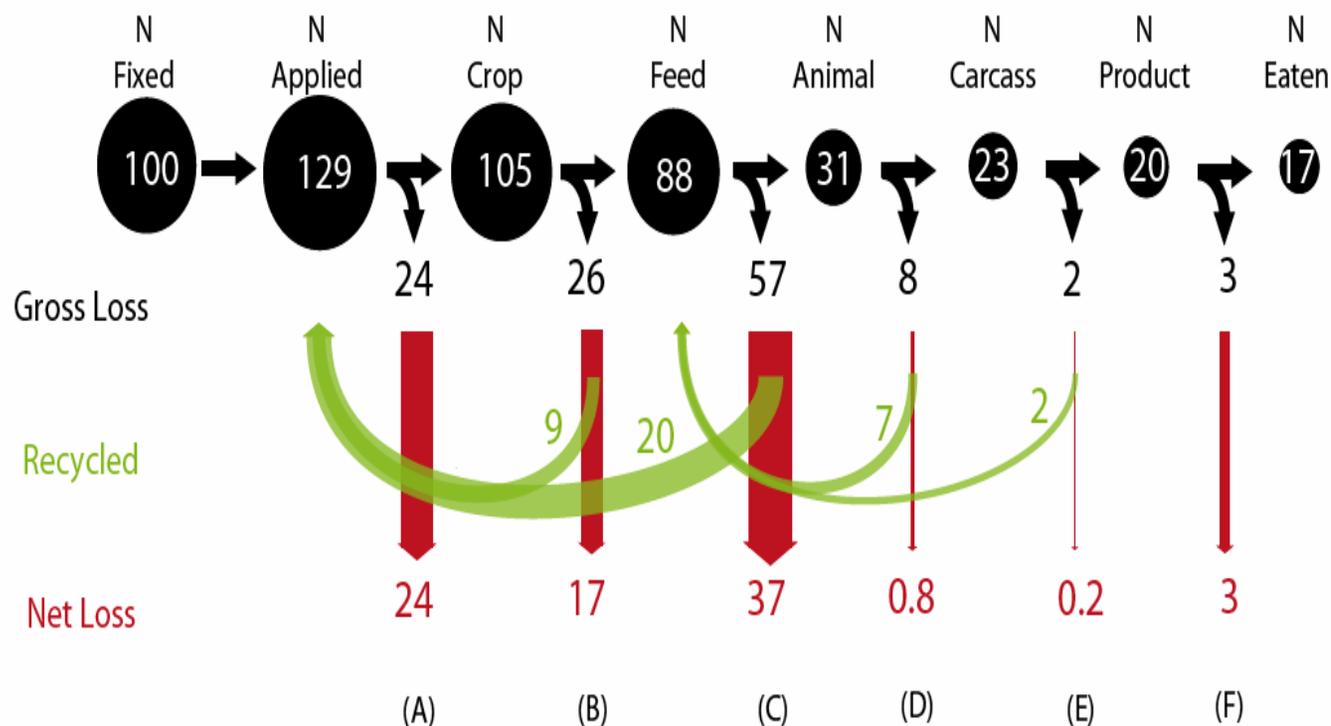
Main Points

- Nitrogen, carbon, phosphorus conservation in farming systems and agricultural landscapes.
- Not a technological problem (Yet).
- Mostly a policy, program, and institutional problem.
- Four suggestions for attention.
 - Conservation “intelligence.”
 - Technical advice/assistance networks.
 - Policy and program reform.
 - Scientific and technical advances.





Carbon, Nitrogen, Phosphorus *CONSERVATION*



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“Despite some recycling, over 80% of the fertilizer N applied to a farmer’s field devoted to animal feed production is eventually lost to the environment (red arrows), partly to the air as ammonia and nitrogen oxides and partly to rivers, groundwater and estuaries as nitrate. Less than 20% is consumed by humans as meat. From Galloway et al., in press.” UNEP Reactive Nitrogen in the Environment, 2007.



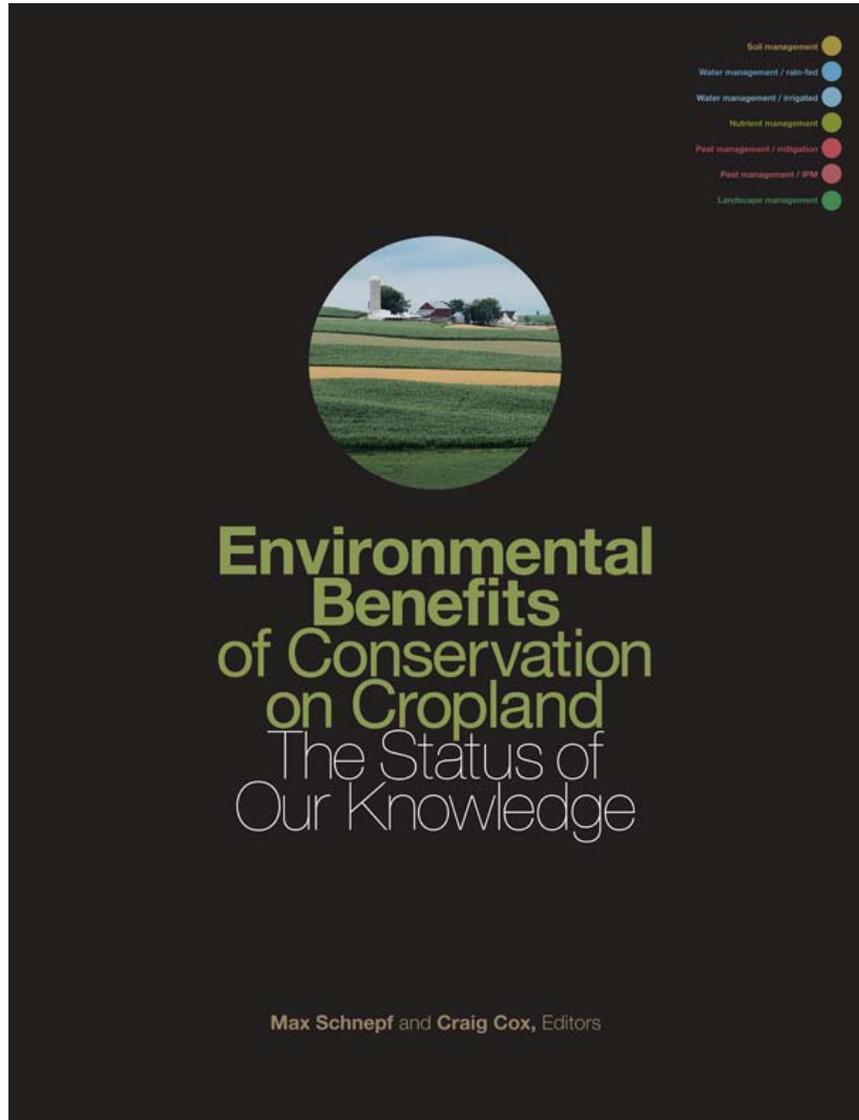
Carbon, Nitrogen, Phosphorus *CONSERVATION*

- Corn is king: 40% N; 4.7million tons.
- Modern farming systems are leaky but productive (so far).
- Modern farming landscapes are also leaky.
 - No vegetative cover for most of the year.
 - Surface or tile drainage.
- Conserve C, N, and P in farming systems and landscapes.
 - Enhance cycling *within* farming systems and landscapes.
 - Means less “fossil” C, N, and P introduced.





We Have the Right Practices Right Now



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Short List of Practices Field and Farm Scale

- Adjust inputs more closely to crop needs:
 - Tissue tests, pre-sidedress tests, fall stalk tests.
 - Apply after planting or after crop emergence.
- Adjust inputs more closely to soil/landscape:
 - GIS/GPS based variable rate application.
 - Mostly production focused to date.





Short List of Practices Field and Farm Scale

- Keeping N in soil/water/plant system:
 - *Cover Crops* (most underutilized opportunity).
 - Reduced or no-tillage systems.
 - Diverse crop rotations.
 - Strip cropping.
 - Irrigation scheduling and application.
 - Organic amendments.



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Short List of Practices Landscape Scale

- Wetlands.
- Riparian buffers
- Filter strips.
- Waterways.
- Stream restoration (reconnect to floodplain).

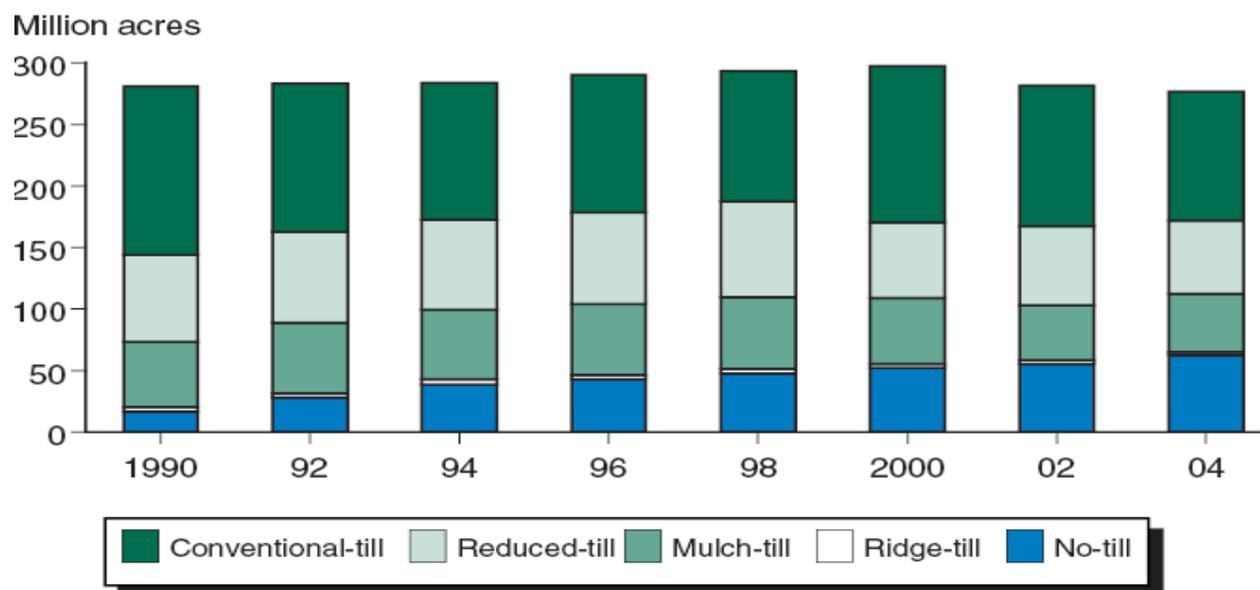


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We Are Using Much Less than We Know

Tillage types, 1990-2004



Source: USDA, ERS, based on National Crop Residue Management Survey data from the Conservation Technology Information Center (CTIC).

- 22 percent of cropland acres in no-till.
- Maybe one-third with more than 30 percent residue?
- No improvement in soil erosion since 1997—could be going backwards.



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We Are Using Much Less than We Know

- 2006 ERS AREI reports no significant trend in nutrient management:
 - 1997: 27 percent of acres had N applied in fall—the worst time.
 - 1997: 30 percent of acres had N applied after planting—the best time.
- Des Moines Register 04.06.08: application of manure on frozen ground raises ammonia to dangerous levels in Iowa streams.





Two Take Away Messages

- 1) We know very little—in a systematic way—about the type, extent, and geographic distribution of conservation and environmental management practices.
- 2) What we do know indicates that current management is far below the technological frontier. In many, if not most cases, application of the very basic conservation and nutrient management practices would produce a big pay-off.



Four Suggestions

- 1) Rebuild (reinvent) our capability to survey and monitor management of agricultural operations and landscapes.
- 2) Rebuild (reinvent) scientific and technical assistance and support network.
- 3) Fundamental reform of agricultural/environmental policy and programs.
- 4) Scientific advances that would help a lot.





Conservation “Intelligence”

- Most basic information we need to direct policy and programs is up-to-date information about how agricultural operations and landscapes are managed.
- We are close to flying blind.
- Take 1 percent of \$5 billion USDA program budget for conservation intelligence.





Scientific-Technical Assistance Networks

- Most important practices and systems are knowledge-based.
- Targeting requires capability to analyze data at local-scales.
- Current scientific and technical support and assistance networks are fraying.
- Policy and program reform constrained by fraying network—good policy and good science is not getting implemented.
- Primary federal role to help reinvent and build network capable of dealing with environmental challenges and escaping traditional agenda.





Policy and Program Reform

- **Voluntary Programs:**
 - Targeting, targeting, targeting.
 - Priorities, priorities, priorities.
 - Focus resources on multi-producer projects.
- **Regulatory Programs:**
 - Essential.
 - Regulatory frameworks that:
 - Don't rely on individual permits.
 - Work through local intermediaries.
- **Water, energy, and climate change will drive agenda.**





Scientific and Technical Advances

- Lower the cost of getting conservation intelligence—remote sensing and related technologies in all their various forms (e.g. can we remotely sense soil cover; riparian buffers?).
- Enable “precision conservation”:
practical tools to get right practices in right places.
- Design voluntary/regulatory hybrids.





Thank You and Good Luck

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