

Statement of  
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On  
Nutrient Pollution: An Overview of Nutrient Reduction Approaches

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Environmental and Public Works

Subcommittee on Water and Wildlife

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Senator Cardin, Senator Sessions and Members of the Subcommittee, I am Nick Maravell, an organic crop, livestock and vegetable farmer for the past 30 years.

I own and operate Nick's Organic Farm, located in Montgomery and Frederick Counties, Maryland. We have 170 acres in production. I consider us a small family farm.

We operate a diversified and integrated farm, raising several types of crops and animals together. As an ecologically based operation, we rely on crop and animal diversity, lengthy crop rotations and rotational grazing. We strive to manage our nutrients with minimum risk of polluting our waters.

Our farm is continually evolving—a work in progress-- as we look for ways to improve our practices. We currently conduct on-farm research in conjunction with USDA's Beltsville Agricultural Research Center, and have previously cooperated with the University of Maryland and the Maryland Department of Agriculture. We have been able to weather good years and bad due to our improving soil quality—which has also lead to better water quality through more efficient nutrient use and better nutrient holding capacity.

With minimal off-farm fertility inputs, we raise grass fed Angus beef, pastured chickens and turkeys, and free range eggs. We sell various types of mixed hays. We produce field corn, soybeans, and barley. We grind our grains and sell organic poultry feed. We grow fresh vegetable soybeans in addition to producing organic, GMO-free seed for food grade corn and soybeans.

Equally important to our production is our marketing strategy; it reflects our product diversity, our small size and our customer's desire for local and sustainable production.

We must add value on-farm to be economically viable. We do this by making our products organic and grassfed, by selling about 90% directly to the final user, and by on-farm processing. We process our own poultry, pack our eggs and vegetable soybeans, condition our seed, and grind our grains into poultry feed.

On average, our sales growth is 10-20% each year, on par with the general growth rate of the \$30 billion nationwide organic industry. Our markets are local and regional, and our minimal impact on the environment is very important to us and our customers and a major selling point for our products.

To understand how we manage our nutrients and guard against nutrient pollution, I will briefly describe our farming philosophy and specific practices, and comment on my experience with existing programs.

We view half of our farm as living above the ground and the other half as living in the soil. We begin constructing our farming system around the long term sustainability of the soil.

For example, when we took over the corn-soybean fields at the Frederick farm, a three foot wide by one and a half foot deep erosion gully cut through the center of the farm, having formed that season. That fall we filled it in by disking. Then we began our rotations, smaller field sizes, and contour farming. Erosion has never returned to the farm, despite the fact that all of our soils are classified as highly erodible.

We are trying to produce a soil with rich biological activity, good tilth and soil structure, good water holding capacity, good aeration, and the appropriate amount of available plant nutrients. In general, adding organic matter to the soil and minimizing tillage are good ways to achieve these characteristics.

Our soil building program is based on crop rotations, cover crops, animal rotations, and minimal off farm inputs. We have an 8-12 year rotation that includes alfalfa/grass hay, pasture, corn, soybeans, and barley. Our rotations are interspersed with cool weather cover crops of rye grain or barley with hairy vetch, and warm weather crops of sorghum and sorghum/sudangrass and cowpeas. Often these crops are planted no-till into previous crops or directly into perennial hay or pasture.

Except for our corn and beans, we rely on multiple species plantings to take advantage of each species unique strengths in foraging for nutrients which ultimately can be recycled from that crop's organic residue and made available for the next crop to use. Multiple species plantings generally create more total biomass by occupying different ecological niches or layers in the growing area, thereby providing good ground cover for erosion control and increasing organic matter returned to the soil.

Our small field sizes of 7-15 acres allow us to tailor our fertility practices to the lay of the land and its specific nutrient needs. We add high calcium agricultural lime every 3-7 years depending on need. We add potassium sulfate and soft colloidal rock phosphate

less frequently, as needed in specific fields. Once or twice every 8-12 years, a field may be amended with 2 tons per acre of off-farm poultry litter ahead of planting corn. With the exception of the poultry litter, all these sources of off farm nutrients are slow release, not highly water soluble, and pose very little risk of polluting our waters. Soon we hope to add nutrients through on-farm composting made from local food scraps, off-farm poultry litter, and wood chips.

Our nitrogen is supplied both through growing and incorporating legumes (alfalfa, vetch, clover, soybeans, field peas, cowpeas), incorporating organic plant residues from previous crops, and roots sloughed off after each hay cuttings—usually five times each season. Other sources of nitrogen are derived from earthworms and other macro and micro biological activity in the soil, and manure from rotational grazing of beef and poultry.

Of our nitrogen sources, the animal manure has the most potential for nutrient pollution. We try to manage our livestock so that manure does not accumulate in one place, has a chance to decompose quickly, and surface run off is readily absorbed into soil covered with vegetation.

We have no streams running through our farms. We have only 80 head of cattle and a few hundred chickens on about 150 acres of cultivated land.

We also use grassed waterways and still farm our fields on the contour. In addition we have grassed buffer zones (25-50 feet wide) to separate our farm from neighboring non-organic farmland.

To prevent manure build up, feed and water is constantly moved. Mobile pens without floors move the poultry across the pastures. Hay for our beef is unrolled on the ground in constantly changing locations or fed from feeder wagons constantly moved. In non-freezing weather, our watering system is mobile. Our beef are never fed grain and are never brought inside (except for a sick animal), so we do not accumulate manure piles.

Our farming system lacks certain characteristics, prevalent on many farms today, some of which if not carefully managed, can increase the risk of nutrient pollution:

- We are not a highly concentrated confined animal feeding operation centralizing the accumulation of manure on a land base that cannot produce enough feed for all of its livestock.
- We do not specialize in primarily one type of production, such as livestock, cash grains or fiber, forages, vegetables, or perennials.
- We do not rely primarily on off-farm water soluble fertilizers to supply nutrients to our plants.

- We do not have very large fields with short 2 year rotations of monocultures, such as corn-wheat-beans.
- We do not produce for a commodity or export market.
- We do not lose the identity of our product as it is marketed.

Let me emphasize that American agriculture is very varied, and that diversity is a tremendous strength that should be preserved. Because there is no one model that should apply to all farms, our national policy and programs should have the flexibility to accommodate our legitimate differences. I like to call this the multiple models approach.

To the extent that farming systems similar to ours are desirable for reducing nutrient pollution, our Federal programs should be examined to determine if they are structured properly to provide support and incentives for other farms to adopt these practices. From my experience, some restructuring may be needed. Let me explain.

Because our farm is different in many ways from the majority of America's farms, we often do not easily meet the eligibility criteria for the programs created to reduce nutrient pollution and encourage conservation. This is both a problem and an opportunity. The problem is most existing programs do not provide a strong incentive to adopt *comprehensive* approaches that inherently prevent nutrient pollution—most programs go after specific practices only, not complete systems.

The opportunity is to promote new programs tailored to the regional nutrient reduction needs of our nation's farms. For example, in 2008 Congress created the Chesapeake Bay Watershed Initiative to help farmers address nutrient runoff. It is so important to farmers that Congress continue and expand this program. I talk with many other farmers who feel the responsibility and pressure from their states to address these nutrient problems for the Bay, but they are very anxious about being able to afford new mandates and uncertain about the availability of future funding. These farmers need help to accomplish the states' requirements for reducing nutrient pollution. At the same time the states need flexibility to work with their farmers to achieve these nutrient pollution reduction goals. One area in particular where the states could use more flexibility is in the allocation of technical assistance funds to the areas and through the programs that will have maximum impact on reducing nutrient pollution. Right now these technical assistance funds can only be used through EQIP, the Environmental Quality Incentives Program.

Finally, I want to comment on what nutrient pollution reduction approaches have been most helpful to me and what approaches could use improvement.

- On-farm research in collaboration with research personnel has always proved to be the most successful approach to improving our fertility decisions without increasing nutrient pollution. The on-farm research can be made most effective when dissemination of results to other farms is combined with onsite technical

assistance from the research, extension, and conservation community. In these times of budget constraint, I think the argument can be made that it is far less expensive to prevent nutrient pollution than remediate its ill effects.

- I have found that market forces are an extremely effective incentive in increasing the farmer's economic bottom line for providing ecological services to his locality or region. Bringing consumers and farmers together or allowing for some identity preservation of farm products provide the ultimate and direct accountability between agriculture and our local and regional environmental preservation efforts. Our State Department of Agriculture has advanced such efforts as farmer's markets, Maryland's Best Label, defining "local production," and administering the Organic Certification Program and label.
- Providing assistance to plant cover crops is an excellent approach to recycling nutrients. However, states could explicitly provide more flexibility in such areas as: planting multiple species, using new innovative species, setting earlier and later planting dates, exploring summer covers. Maryland has made great strides in some of these areas, but more could be done.
- Providing assistance to farmers who are responsibly managing their soil and nutrients but who want to make further improvements is an excellent approach. The Conservation Stewardship Program (CSP) attempts to move in this direction, but when I applied I found that from the national level the program had built in biases that did not fit my farming model and that of many other organic and sustainable farmers. The CSP strongly favors no-till planting and does not easily accommodate operations that rotate animals and annual crops over the same ground. While our state scored our farm in the highest possible tier and awarded us a grant, or grant terms restrict our pasturing and crop options.
- Because our farming system does not accumulate large amounts of nutrients that can easily enter our water ways, filing our Nutrient Management Plan once every three years with annual updates has not resulted in our changing any of our practices. The State should provide the flexibility to require some operations, in the absence of major changes, to file a new plan once every five years with annual updates. This change could save time, money and staff resources, which could be redirected to onsite technical assistance.
- Other than through the cover crop program, our farm has never received assistance under EQIP, the Environmental Quality Incentives Program. Perhaps that is our fault, but somehow the criteria just never seem to fit well with our circumstances. As one district conservationist said after we walked the entire farm together, "There are no environmental benefits to be derived from this farm." He enlightened me by saying our farm did not have any recognizable environmental problems. I am encouraged by some recent EQIP initiatives that are designed to provide incentives to move toward environmentally sustainable

practices without first having to demonstrate the prevalence of less sustainable practices.

I applaud the effort of this subcommittee to work with family farmers to help them remain profitable while increasing their ability to effectively manage their nutrients.