# Site Index Looks At Potential Phosphorous 'Hot Spots'

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GRANTVILLE (Dauphin Co.) — To put the brakes on potential phosphorous runoff from farmland, efforts may have to focus on the "hot spots" — particular areas on a farm already testing high with phosphorous and prone to pose a threat to watersheds.

That's the message delivered by a research leader with USDA Agriculture Research Service (ARS) last week at the Mid-Atlantic No-Till Conference at the Holiday Inn in Grantville.

At the recent no-till conference in Grantville were, from left, Mark Goodson, agronomy agent, York County, and speaker Dr. Andrew Sharpley, research soil scientist with USDA-ARS.

Dr. Andrew N. Sharpley, research leader with USDA-ARS Pasture Systems and Watershed Management Research Lab, associated with Penn State, spoke to about 111 growers, crop advisers, and other agri-industry representatives at the tillage conference.

Sharpley provided an overview on work with the phosphorous index, a site assessment tool, in work done on several farms in a nearby watershed.

In field maps, site index identification can map potential "hot spots" for phosphorous runoff. The index can tell soil scientists where phosphorous levels are high, where potential runoff can occur, but it doesn't answer the ultimate question: does phosphorous get into the streams?

The site covers four farms in Northumberland County, encompassing about 40 hectares, Sharpley noted.

The FD-36 watershed has swine, poultry, and other types of farms nearby. All research was done on lease agreements, Sharpley said. About 30 percent of the land was in forest and there was some grazing.

Most of the farmland was in row crops, with corn/soybean rotations, and some alfalfa, he noted. The grid sampling began about three years ago, including phosphorous.

Agronomists are aware that corn has virtually no response above 50 parts per million (PPM) of phosphorous. Above 100 ppm, there is no defining crop response.

Of the areas mapped, about 60-70 percent of the cropped area were above sufficient in terms of phosphorous, mostly from applications of swine slurry and poultry manure.

There were streams and creeks on the farmland next to fields with high levels of phosphorous.

What the research concluded was that there are "some areas more at risk than others," Sharpley said.

The national site index work began with the Natural Resource Conservation Service (NRCS) in 1990, at the Southwest Technical Institute in Fort Worth, Texas. For years the group studied phosphorous loss in soils, and concluded that a combination of factors — including modes of transportation of the soil resource and the source of the material — contributed to potential runoff hazards.

Proximity of the hot spots to streams could be the real culprit. Managing those hot spots could provide more efficient at controlling general runoff levels rather than using a standard, whole-farm approach.

"Where we are on the landscape is critical," he said. "Phosphorous has to travel a long way to get to a stream or channel."

Soil texture and permeability are keys. Wet areas in the winter on soil, or applying the material to snow or ice, can contribute to runoff problems. Much of the runoff in the Northeast, he noted, could be blamed on saturated excess of phosphorous in wet areas of land. Though heavy downpours can contribute to runoff, this region experiences that situation rarely if at all.

In the future, USDA-ARS may come up with a way to, using GIS and mapping software, distinctly identify areas of farms where runoff ability is high or low, he noted.

Sharpley noted that 90 percent of the phosphorous from a watershed is generated from 20-25 percent of the land — especially the "hot spots."

Right now, producers can stem the runoff by improving manure incorporation. If the fer-

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