

# National Air Quality Initiative (NAQI)

## Delaware



The National Air Quality Initiative (NAQI) of the USDA Natural Resources Conservation Service (NRCS) provides financial assistance to implement conservation practices that address air resource issues for designated locations throughout the nation. NRCS in Delaware is working with farmers to reduce or minimize air pollutants that could result from agricultural production.

### Background

Agriculture is the primary industry on the Delmarva Peninsula. The poultry industry is especially significant for Delaware as Sussex County boasts the largest broiler producing county in the United States. In addition, most of the corn and soybean crops grown in the Delmarva region support the poultry industry.

### Actions

The NAQI in Delaware is helping poultry growers reduce ammonia emissions, odors, or Volatile Organic Compounds (VOCs) that are associated with raising poultry. In addition, this initiative is reducing oxides of nitrogen emissions that come from diesel engines used to pump irrigation water on cropland.

### Results:

Thanks to the NAQI funding, the following practices have been implemented or planned:



*Windbreak helps capture dust and particulate matter from poultry operation.*

#### Fiscal Year 2015

Practices	Units/Acres	Funds Obligated
Combustion System Improvement	4 Units	\$25,573
Hedgerow Planting	860 feet	\$3,350
Amendments for the Treatment of Agricultural Waste	341 animal units	\$40,854
<b>Contracts:</b> Delaware obligated seven contracts for a total of \$69,777.		

#### Fiscal Year 2016

Practices	Units/Acres	Funds Obligated
Combustion System Improvement	1 Unit	\$15,961
Windbreak/Shelterbelt Establishment	460 feet	\$1,246
Amendments for the Treatment of Agricultural Waste	2,065 animal units	\$97,357
<b>Contracts:</b> Delaware obligated seven contracts for a total of \$114,564.		



## Innovative Approaches to Improve Air Quality on Poultry Operations

In addition to the National Air Quality Initiative, a Conservation Innovation Grant (CIG) was awarded to the University of Delaware to evaluate conservation practices that could help growers further manage poultry house emissions.

In recent years, Vegetative Environmental Buffers (VEBs) have gained significant attention throughout the poultry industry as a way to capture and reduce particulate matter from poultry houses. Research has shown that VEBs (strategic “hedgerows” composed of trees, shrubs, and grasses) can survive and capture exhaust from the poultry fans. With help from a USDA conservation grant, the University of Delaware (UD) is approaching an innovative way to reduce air emissions from poultry houses using VEBs in conjunction with a new technology—and to quantify the effectiveness of them.

Dr. Hong Li, Project Director with UD, suggested that this project was intended to be a proactive solution for future air quality regulations. Although Delaware currently does not have any air quality regulations for poultry emissions, Dr. Li thinks they’re coming. In 2005, The Environmental Protection Agency (EPA) conducted a National Air Emissions Monitoring Study, a two-year examination of air emissions from poultry, swine and dairy animal feeding operations (AFOs). The primary goals of the study were to promote a national consensus on methodologies for estimating emissions from AFOs and reduce air pollution. “Since it is likely that EPA will step up regulations concerning these emissions, cost-effective best management practices (BMPs) to reduce air emissions from AFOs are needed,” said Dr. Li.

Dr. Li has worked with Delmarva Poultry Industry’s (DPI) Jim Passwaters, researchers from USDA Agricultural Research Service, staff from USDA’s Plant Materials Center and neighboring universities and partners to go one step beyond traditional research. While research has shown that VEBs capture pollutants; determining the efficacy of VEBs combined with the new technology of scrubbers answers the question of ‘how efficient are these technologies in reducing pollutants from the air?’

A scrubber is a permanent fixture attached to a side wall fan of a poultry house. A scrubber removes ammonia, particulate matter and other pollutants from poultry exhaust fumes as air passes through a scrubbing liquid (water and diluted acids), reacts with the liquid and forms ammonium salts—effectively “scrubbing” the air. While most scrubbers are extremely expensive at \$50,000, this study uses a new type that may offer effective remediation at \$10,000 a unit.

Why VEBs and scrubbers together? Vegetative Environmental Buffers reduce air emissions best during warm seasons when trees and grasses are fully leafed out and growing, which coincides when tunnel exhaust fans are used most—late spring through early fall. Scrubbers compliment VEBs because they are used on side-wall fans during cold seasons when these fans are used the most.

The USDA Natural Resources Conservation Service (NRCS) provided a \$967,000 Conservation Innovation Grant (CIG) in 2012 to UD to help them achieve the goal of this project, which will help poultry producers improve their environmental performance to achieve sustainable operations. Currently there are five scrubbers and two different VEBs being evaluated on four sites in Delaware, Pennsylvania and Arkansas. Utilizing partner research, the VEBs are already designed with the most durable plants in mind. Li and his team set up a measuring instrument in and around the VEBs and scrubbers to measure emission reductions. At least seven months of data have been collected.

“Once the project has final data, we will develop criteria concerning the design and implementation of scrubbers to be used in conjunction with VEBs for inclusion in new or existing National Conservation Practice Standards,” said Li. “Then VEBs and scrubbers can be used in the model for TMDL, to estimate nitrogen deposition from air, to show reduced emissions.”

For more information, contact Hong Li at [hli@udel.edu](mailto:hli@udel.edu) and visit the project website: <http://sites.udel.edu/vebscrubber>.

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*Scrubber is attached to the side wall fan of poultry house to remove pollutant emissions to improve air quality.*

