Swine Wastewater Treatment in Constructed Wetlands. (A05-hunt171018-Oral)

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Abstract:

Constructed wetlands have been used extensively around the globe for over three decades to provide municipal and industrial wastewater treatment. Recently, constructed wetland technology has been used to provide more effective and socially acceptable methods for treatment of swine wastewater. They have been effective in treating nitrogen at loading rates as high as 25 kg/ha/day, but ineffective for phosphorus removal at the levels present in swine wastewater. Typically, wetlands have considerable denitrification potential, and denitrification becomes the dominant removal mechanism when loading rates exceed 10 kg N/ha/day. Although ammonia can be lost through volatilization, losses are normally less than 15% of the applied total nitrogen. However, in marsh-pond-marsh wetlands, ammonia volatilization can be significant in the pond section. The level of nitrogen treatment can be greatly influenced by vegetative cover, water depth, and loading cycle. Even partial pre-wetland nitrification can greatly reduce ammonia volatilization and increase denitrification; but it is expensive. Furthermore, at very high nitrate loading rates, denitrification can be limited by available carbon. Wetlands are best used as part of a total swine management system.

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