# Fruit Waste Based Ammonia-Biosorptive Permeable Barriers

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Near domestic and commercial agricultural settings, ammonia runoff is a threat to freshwater ecosystems. Research by scientist Milena Beniolo found that banana peels effectively absorbed positively charged metals in water. To confront a threat facing more freshwater ecosystems, this project, titled Fruit Waste Based Ammonia-Biosorptive Permeable Barriers, examines the effect of banana and orange peel powders on ammonia contamination in runoff. If water polluted with ammonia passes through permeable blocks that have various fruit peel powder additives (5 of each- control, banana, orange, orange/banana), then the amount of ammonia in the water will be reduced the most by the orange/banana mixture peel powder additives. After contaminated runoff was passed through the blocks on the second trial, the original 2ppm [NH4+] was reduced by 73.5% by orange/banana, 73% by banana, and 61% by orange (control- 12.5%). Calculations showed the least variance with the orange and orange/banana, whereas the banana tests showed high levels of variance: all p-values of t tests were significant. The blocks with orange/banana powder additives had the biosorptive and physical strength of the blocks with banana peel powder and the consistency of the bricks with orange peel powder. This experiment poses the possibility to fight pollution at the source instead of at the end point.

**Awards Won:**