The Nutrient Recycling Challenge

EPA Office of Water, Water Permits Division

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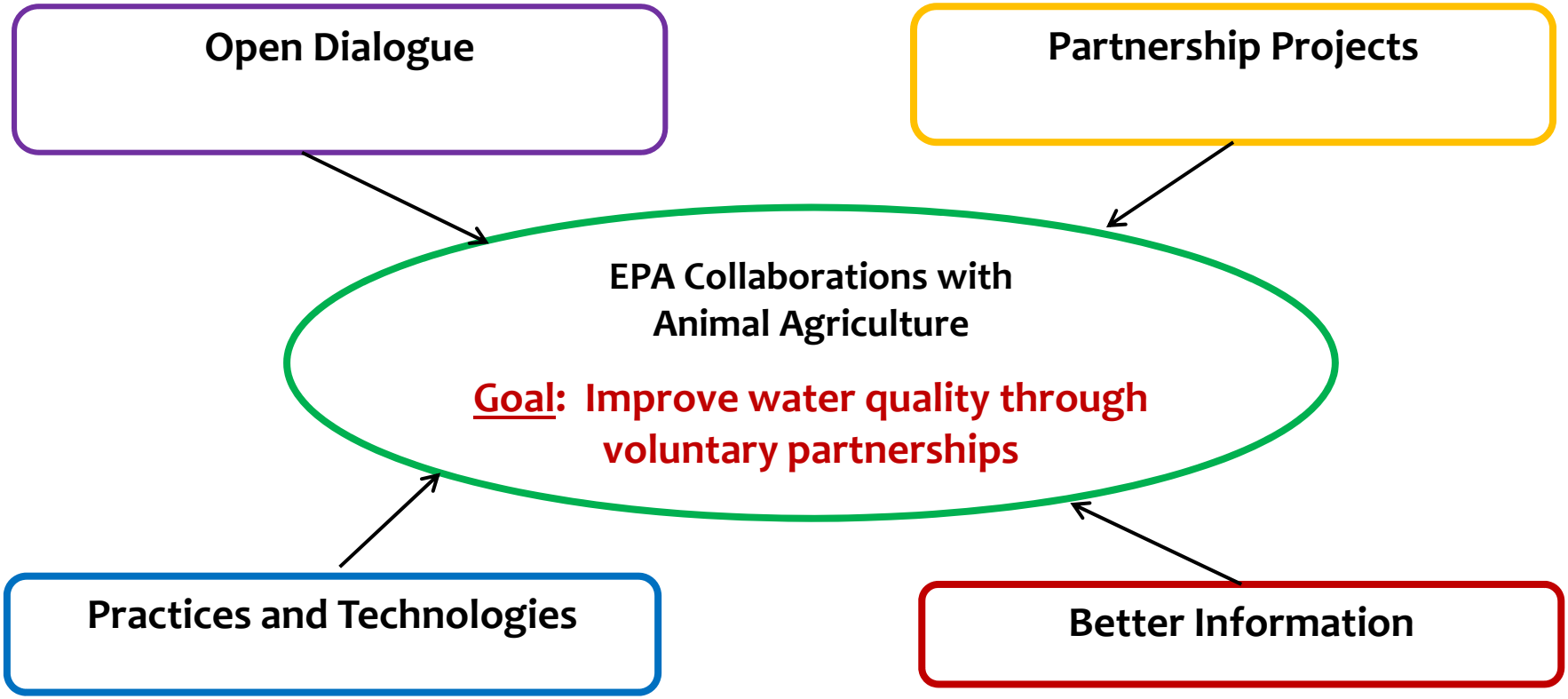
EPA Collaborations with Animal Agriculture



The Nutrient Recycling Challenge

Pre-launch draft concepts: 10/27/2015

Every year, livestock producers
manage over a billion tons of animal manure
which contains valuable nutrients
—nitrogen and phosphorus—
that plants need to grow.

Manure can be a resource as a renewable fertilizer, but should be used properly to minimize water pollution and build healthy soils.

Farmers across America are asking,

“How can I manage nutrients on my farm better and more affordably?”

Moving Nutrients: Somewhere in the rural Tanjore District of India, 2012

Photo by Subramanian, H. (2012).

Example Nutrient Recovery Technology in the U.S.

Vanderhhaak Dairy – Whatcom County, WA

Anaerobic co-digestion, solids separation, ammonia stripping and production of ammonium sulfate solution, and manufacture of peat moss substitute from digested fibers

Photo by Subramanian, H. (2015).

What if there was a technology that could capture the phosphorus and nitrogen in livestock manure and turn it into lightweight fertilizer?

What if farmers could not only afford this technology, but it could actually improve their bottom lines – by lowering the cost of managing their farms or generating new revenues?

There is a tremendous market opportunity and potential for environmental benefits.

This innovation is happening.

Scientists and engineers are building technologies that can recover nutrients, but further development is needed to make them more effective and affordable.

Now is an optimal time to help cutting-edge innovations advance to the next level.

EPA has partnered with pork and dairy producers, U.S. Department of Agriculture, World Wildlife Fund, and environmental and scientific experts to host

The Nutrient Recycling Challenge

--a competition to find affordable technologies to recycle nutrients from livestock waste and create valuable products.

Agri-Mark

American Biogas Council

American Society of Biological and Agricultural Engineers

Ben & Jerry's

Cabot Creamery

Cooper Farms

CowPots

Dairy Farmers of America

Innovation Center for U.S. Dairy

Iowa State University

Marquette University

National Milk Producers Federation

National Pork Producers Council

Newtrient LLC

Smithfield

Strategic Conservation Solutions

Tyson Foods

USDA

Washington State University

Water Environment Research Foundation

World Wildlife Fund

Why an Innovation Challenge?

- Bring new innovators to the table and connect them to each other, and to animal ag producers (users)
- Encourage the design of new/improved technologies through competition
- Drive down the cost of the technology to meet market demands
- Stimulate markets for technologies and the co-products their produce

The Nutrient Recycling Challenge is harnessing the global power and ingenuity of competition to find solutions that are a win-win for the environment, farmers, and the economy.

Goals of the Nutrient Recycling Challenge

- Accelerate the development of nutrient recovery technologies that are adoptable for pork and dairy farms, and can produce environmental and economic benefits.
- Increase awareness of issues and opportunities related to nutrients and manure management.
- Connect innovators and agricultural stakeholders.
- Stimulate markets for products generated by nutrient recovery technologies.

How will the Nutrient Recycling Challenge work?

Launch date (tentative):	November 12, 2015
Phase I: Concept Papers	November 16, 2015 – January 15, 2016
Phase II: Designs	Spring 2016
Phase III: Prototypes/Proof of Concept	Summer 2016
Phase IV: Demonstration Pilots on farms	Spring 2017

What are we looking for?

Phase I: Concepts – Papers up to 10 pages in length

Required Criteria

Concept papers must demonstrate that the technology would:

- **recover and concentrate nutrients (nitrogen and/or phosphorus) from dairy or swine manure in a usable form; and,**
- **do so in a cost-effective manner**

Additional Desirable Characteristics
(in no particular order)

1. Ability to yield value-added co-products from the recovered nutrients. (Include whether there are identifiable markets for the yielded co-products)
2. Ability to separate liquid & solid streams from manure; decrease moisture content of solids
3. Ability to produce low-nutrient effluent from liquid manure stream
4. Yields multiple benefits; e.g., reduces odors, reduces pathogens, protects/restores water quality, reduces GHG emission, provides other ecosystem benefits, generates reusable water for on-farm use, energy recovery, indoor air quality, benefits to animal health/performance, etc.
5. Compatibility with existing production and manure management systems (e.g, flush, scrape, deep pit, lagoon, digester, solid-liquid separators)
6. Portability
7. Replicability, Scalability
8. Farmer-friendliness (easy to install, operate, etc.)

What will competitors win?

For the first round, which is calling for concept papers, awards will include:

Cash prize: A total of $20,000 for up to four solutions.

And

Invitation to Event in Washington, DC:

Promising applicants will also be invited to an exclusive two-day partnering and investors event in Washington, DC (with additional travel awards).

Promising applicants will also gain entry into subsequent phases of the challenge with larger prizes and more continued rewards, such as:

- more direct funding, investors, and buyers
- no-cost demonstration testing
- more media exposure
- incubation support
- pilots on dairy and pork farms
- more networks of innovators, experts, and agricultural industry reps
- grant opportunities
- participation in case studies

Where are we now?

Submissions open November 16th.

How can the FRRCC be part of this?

- ❑ Your ideas
- ❑ Your help spreading the word
- ❑ Potential partners
- ❑ Links to investors and funders

Nutrient Recycling Challenge: draft logos

Contact:

www.nutrientrecyclingchallenge.org

(tentative url to go live Nov. 12th)

United States Environmental Protection Agency (U.S. EPA)
Office of Water, Wastewater Management, Water Permits Division,
Rural Branch

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