Implementing Precision Feed Management in the NYC Watershed Agricultural Program

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Feed nutrients represent the largest pool of nutrients on livestock farms in the NYC Watershed. In the last two years, the NYC Watershed Agricultural Program (NYCWAP) West of Hudson added precision feed management (PFM) as a nutrient management planning best management practice for dairy and beef farms in that watershed. This BMP, developed and piloted by Cornell Cooperative Extension over the last fifteen years, reduces feed nutrient imports, improves milk/beef nutrient exports, and minimizes excessive manure nutrient excretions through an approach integrating homegrown feed production, ration management, and cattle production best practices. PFM addresses both on-farm nutrient cycling and whole farm mass nutrient balance. In a process unique to the NYCWAP, PFM combines a feed management plan written and renewed every three years and according to the USDA NRCS feed management standard, an annual feed management implementation plan, and quarterly ration monitoring to ensure rations consistently meet precision feed management benchmarks. Regular assistance by PFM planners help farmers implement strategies identified in their feed management plans. In 2017, PFM was implemented on 32 dairy farms and over 2,000 cows, with 54,985 kg of feed phosphorus (P) and 360,386 kg of feed nitrogen (N) under management. On farms where dietary interventions were made, a 23% reduction in manure P excretion (5.5 kg per cow per year) and a 7% reduction in manure N excretion (10.2 kg/cow/year) was modelled. Precision feed management can be a win-win for both the environment and farms. Farmer participants frequently cite the regular contact and management assistance from PFM planners as helpful to their businesses. With assistance from their PFM planner, one farm in the past year increased homegrown feed levels 27%, reduced purchased grain nutrient imports 47% and increased milk income over purchased fee costs $1.00 per cow per day.

75 Word Mini-abstract

The NYC Watershed Agricultural Program West of Hudson includes precision feed management (PFM) as a best management practice for dairy and beef farms. PFM combines a written feed management plan, annual implementation planning, and quarterly ration monitoring. In 2017, PFM was implemented on 32 dairy farms and over 2,000 cows, with 54,985 kg of feed phosphorus and 360,386 kg of feed nitrogen under management. PFM can be a win-win for both the environment and farms.
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Implementing Precision Feed Management in the NYCWAP
Precision Feed Management in the WAP

- 2015 PFM was added to the WAP with DEP funding as part of the Nutrient Management Planning and Implementation efforts.
- The 2017 NYC Filtration Avoidance Determination (FAD) requires implementation of PFM on up to 60 eligible farms.
  - Mostly dairy, some beef
- PFM and NM planning complete the nutrient management cycle addressing feed nutrients produced and fed as well as manure nutrients distributed.
Precision Feed Management in the WAP

PFM is a Management BMP that addresses;

• Feed nutrients produced on the farm;
• Feed nutrients Imported to the farm;
• Rations formulated and fed on the farm;
• Non-ration animal production factors that effect production efficiency;
Precision Feed Management in the WAP

• PFM engages the participant to change their management to effect change *over time*.

• There are multiple contacts with the participant each year to develop and implement the Feed Management Plan.
  • This is different from our Structural Best Management Practices (BMPs) such as covered barnyards or manure storages which change the physical layout of a farm to effect change at a time point in farms

• PFM is really a continuous improvement process.
The PFM Process:
A Continual Improvement Process

Planning

Implement

Monitor

Planning

Implement

Monitor
Precision Feed Management in the WAP

**PFM has three major components:**

1. Feed Management Planning (NRCS 592 Standard) - 3-5 year plan
2. Quality Management Assistance (QMA) - Annual Implementation Goals and Strategies
3. Benchmarking – Regular Monitoring
Precision Feed Management in the WAP

• The Quality Management Assistance (QMA) component provides a structure and accountability for a management BMP like PFM in a traditional conservation program similar to the structural BMP process.

• Quality Management Assistance is unique to our program!
Precision Feed Management in the WAP

QMA helps us build on the relationships that we have built with the participants over the last 25 years to:

• Identify issues involving feeding, crop management or nutrient accumulation in soil with benchmarks, science based information, personal knowledge and experience of the industry.
• Set reasonable and attainable goals over 3-12 months.
• Monitor and follow up with monthly visits.
• Help assist with corrective action as needed to achieve the goals by working with the other consultants or advisors specific to that farm.
• Document results and impacts.
Precision Feed Management in the WAP

- The Success of PFM is only possible with a strong trusting relationship and partnership built up over time with the participants to effect change!
What is it we do in PFM?
PFM: Who is “We”? 

WAP PFM Team
• April Wright-Lucas MS, CCA, PAS
• Shylabeth Taylor
• Melinda Gaida
• Wendy Hanselman
• Paul Cerosaletti MS, CCA, PAS
• Dale Dewing MS, CCA

WAP NM Team
• Cindy McCarthy CCA
• Nate Nero CCA
• Kari Sheridan CCA
• Brent McKeon
• Ben Hepler
• Kim Holden
• Paul Cerosaletti MS CCA PAS
• Dale Dewing MS CCA
NYC WAP PFM Program Model

2017 PFM Engagement:
- 373 QMA events;
- 869 Farm Contacts;
- 115 PFM Benchmarks;
- 33 Annual QMA plans;
- 33 Farms with FMPs;
Dairy Farm Mass Nutrient Balance - 2017

30 kgs. P/cow/yr
199 kgs. N/cow/yr

Feed Nutrients Under Management

54,985 kg P/yr
360,386 kg N/yr

29 Farms - PFM Program 2017
Purchased Feed → Milk → N + P → Profit → Environmental Risk

Home Grown Feeds
Crop Production
- Forage Harvest timing.
- Reduced field operations (timeliness)
- Pasture management
- Intensive Grass Management
- Crop Rotation
- Species and Hybrid selection
- Fertility and Pest Management

Diet Formulation and Delivery
- Lower Phos
- Balance ration Nitrogen and CHO
- Feed “package”
- Ration forage level
- Amino Acids
- Dry and Transition cow diets
- Feeding Sequence and push ups

Cow Management
- Improved udder health
- Improved reproductive management
- Cow comfort
- Improved heifer Growth

Home Grown Feeds

Purchased Feed

Milk

Cornell Cooperative Extension Delaware County
PFM Program Nutrient Reductions

P Reductions Implemented

28% Farms
25% Cows

23% P Excretion
5.5 kg/cow/yr

Watershed Agricultural Council
www.epcwatershed.org

Cornell Cooperative Extension
Delaware County
PFM Program Nutrient Reductions

N Intake Reductions Implemented

28% Farms
25% Cows

7% N Excretion
10.2 kg/cow/yr

Cornell Cooperative Extension Delaware County
PFM Farm Impact:

PFM Action:
Helped to grow more homegrown feed

Impact
8%
Higher forage feeding

Impact
Reduced grain costs
$20,000

Watershed Agricultural Council
www.eyeonwatershed.org

Cornell Cooperative Extension
Delaware County
PFM Farm Impact:

“... having the feed management planner on their farm has helped the farm stay focused and realize one of their goals; the cows are up 15 lbs of milk/cow/day from a year ago, which results in 1,411 lbs/yr more nitrogen and 257 lbs/yr more Phosphorus exported from the farm in milk sales annually, an increase of nearly $50,000 more in gross milk sales per year.”
PFM Farm Impact

PFM Action:
Assisted with implementing home grown grain production.

Impact
Reduced grain purchases by $25,000

Impact 80%
Diet is homegrown feed

Watershed Agricultural Council
www.epiwatershed.org

Cornell Cooperative Extension
Delaware County
PFM Farm Impact

**PFM Action:**
Improved Udder Health

**Impact**
- $11,991 more milk income/yr
- 1.3 lbs more milk/cow/day
- 61 lbs additional P exported/yr

Photo: Hoards.com

Watershed Agricultural Council
www.epwatershed.org

Cornell Cooperative Extension
Delaware County
Questions?