

# Monitoring Runoff from Winterfeeding In-Pasture System

## Why be Concerned with Runoff?

- Jungnitsch (2008) documented winterfeeding in-pasture system allows for increased nutrient returns to the soil compared to conventional manure application. This creates the opportunity for elevated nutrient concentrations in runoff water.
- Fecal coliforms in runoff water are hazardous to human and animal health.
- Nitrate found in water at levels of  $10 \text{ mg L}^{-1} \text{ NO}_3^{-1}\text{-N}$  or greater pose as a health hazard.
- Phosphorus and nitrogen in runoff water advances eutrophication.

## Objectives

- Evaluate nutrient levels in soil (pre- and post-winterfeeding) for phosphorous and nitrogen concentration.
- Water samples collected from:
  - Control pasture area (no winter feeding)
  - Winterfeeding pasture area
  - Traditional dry-lot feeding area (yard)
- Analyze runoff water for coliforms, nitrogen and phosphorus.
- Propose a strategy to better utilize winterfeeding systems.

## Hypotheses

- Elevated levels of phosphorus and nitrogen in runoff and soil post-winterfeeding.
- Runoff levels of coliforms, nitrogen and phosphorus will be higher from dry-lot in-yard system compared to in-pasture system.
- Winterfeeding in-pasture system will provide better utilization of nutrient returns from manure and feed with the least amount of environmentally harmful runoff compared to dry-lot.

## Approach

### Treatment

1. Stocking rate of 800 cows/day/acre in approximately a 7 acre paddock
2. Approximately 200 bales fed over winter
3. Electric fence moved every 3 days allowing more access to bales
4. Portable windbreaks and hauled water

### Sampling

- Runoff water collected in piezometers are being analyzed for coliforms, nitrogen and phosphorous
- Runoff water collected in 4 basins (2 Treatment and 2 Control) are being analyzed
- Runoff water collected in dry-lot basin and pond (Termuende Yard) are being analyzed
- Soil samples are being analyzed before and after treatment for: nitrogen, phosphorous, carbon, salinity, and pH
- Bales sub sampled to determine nutrient levels