MANAGING REACTIVE NITROGEN ON CENTRAL VALLEY DAIRY FARMS

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TOPICS

- Two important basic premises
- Reactive nitrogen
- What dairy is doing
  - Regulatory
  - Voluntary
  - Current activities
- What’s needed going forward
Dairy Farmers are serious about environmental quality

- Over-arching premises:
  - All people have a right to safe food, safe water, and clean air
  - Excessive reactive nitrogen in the wrong place can be harmful

- Dairy families agree and are responding to the challenge
Why NR and not NO$_3$?

- Multi-media environmental impacts
  - NO$_x$ an ozone & PM precursor
  - N$_2$O a GHG
  - NO$_3$ a water quality issue
  - NH$_3$ – odor & PM 2.5 precursor
  - NH$_4$ – water quality

- Cross-media implications must be considered in CA environmental policy
CHARACTERISTICS OF NR

- Nr is useful and is important to all
  - Ag productivity requires it
  - World food catastrophe held at bay by Nr from Haber-Bosch process

- Nr is “slippery” – easily changes
  - Moves through environmental reservoirs effortlessly

- Concept of a “Production Box”
How is dairy responding?

- Participated in research - identified Nr as an issue we needed to address
- Dairy WDR regulations (2007)
  - Focus on groundwater protection
  - Strict accounting of nitrogen
- Air quality regulations (2009)
  - Focus on NOx from engines
  - VOC rule reduces ammonia N
WATER REGULATIONS

- Waste Management Plan (WMP)
  - Name, location, animals, maps, fields, wells, crops, structures, conveyances
  - Contingency plan
  - Storage requirements
  - Civil engineer required
  - Submitted to RB
WATER REGULATION

- Nutrient Management Plan (NMP)
  - Land application area identified
  - Crops grown, acres, third party agreements, sampling and analysis
  - Nutrient budget (1.4 times uptake)
    - A difficult target for the “Box”
    - Application rate, timing, method
  - Sign-off by NMP specialist
Water regulation

- Salinity report
- Monitoring & reporting
  - Process water, manure, plant tissue, soil
  - Surface water, stormwater, tailwater
  - 6000 domestic and irrigation wells
  - Special groundwater monitoring wells
AIR REGULATION

- Rule 4550 – PM-10 and dust controls, management plan
- Rule 4570 – VOC permitting and permit conditions (significant reductions of ammonia N emissions)
- Rule 4702 – Engine rule (NOx)
- Rule 2201 – New Source rule
- Others for specific circumstances
VOLUNTARY ACTIVITIES

- CA Dairy Quality Assurance Program
  - Environmental Stewardship Module
    - Dozens of training workshops
    - Third-party environmental certification evaluations (475 certified)
    - Thousands of personal contacts
  - Technology development
  - Opened farms & invested in research
SOUGHT FUNDING ASSISTANCE

- USDA/NRCS recognized CA problem
- Cost-share & grant assistance
- $21,000,000 in last 3 years for infrastructure improvements, WMPs, and NMPs
- Dairy families provided 50% match for improvements
CURRENT ACTIVITIES

- Seeking additional assistance for infrastructure enhancements
- Investing in air and water research
- Investigating new technologies and processes for manure management
- Funding irrigation management software development
- “Farmer-to-Farmer” project with SusCon to aid implementation
IN SUM

- Currently focused on groundwater N
- Invested heavily in facility improvements
- Funded research, conducted training
- Improved and are continuing to improve nitrogen management
- Working closely with regulators
- Initiated sophisticated monitoring to chart progress
NEEDS FOR MOVING FORWARD

- Research funds to evaluate potential and traditional BMPs
- R&D funding for innovative equipment and technologies
- Cost-share support for additional infrastructure improvements
- Marketplace analyses of alternative uses for dairy generated nitrogen
- Partnerships – not adversaries
YOUR CALIFORNIA DAIRY FAMILIES ARE SERIOUS ABOUT CLEAN WATER AND CLEAN AIR

Work with us to get it done!