CDFA Manure Recycling & Innovative Products Task Force

Summary of Interim Report

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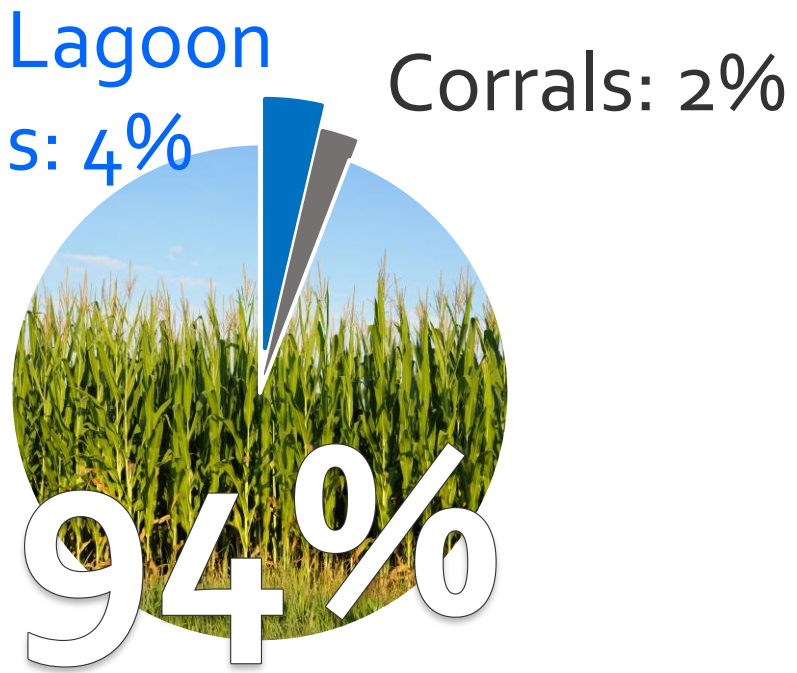
MRIP Task Force

- Began in October, convened by CDFA
- 23 members
- **Nine state/federal/regional public agencies**: CDFA, SWRCB, CARB, CV Regional Board, DWR, CEC, GoBiz, San Joaquin Valley Air Pollution Control District, USDA NRCS
- **Academic:** UC Davis and Cal Poly SLO
- **NGOs**: Sustainable Conservation, Community Water Center
- **Seven CA and national dairy industry**: Two dairy operators, Dairy Cares, CVDRMP, Western United Dairies, Newtrient, Dairy Management Inc.
- **Other**: Agricultural Council, Western Plant Health Association
- Interim report produced in March, "Final" report later this year (Q3), likely will continue to meet on ongoing basis going forward

Task Force Purpose

- **Increase understanding of scale and distribution of nitrogen surplus** on dairies and potential demand from other crops for nitrogen and other manure nutrients;
- **Identify research, technical and policy actions** that encourage recycling surplus nutrients for agricultural use; creating circular fertilizer/soil amendment economy to builds healthy soils, conserve/protect water, makes ag more sustainable;
- **Organize short, mid, and long-term potential solutions and roadmap** for progress; estimate time/resources necessary to achieve research, policy, technology development, and education/outreach objectives.

- **Recommendations intended to reduce and better utilize dairy surplus nitrogen statewide while reducing environmental impacts to communities.**



Management Unit	Acreage (ac)
Corrals	30,254
Lagoons	5,877 (1.3% ac)
Manured Fields	429,424

Acreages from: Harter, Dzurella, Kourakos, Bell, King, Hollander. 2017. Nitrogen Fertilizer Loading to Groundwater in the Central Valley. FREP report. October 2017.

Task Force Work Groups

- **Conventional strategies:** Practices and technology that reduce surplus or facilitate export that are generally available now and broadly practiced, but underemployed
- **Circular economy for N: Yes**
- **Examples:**
  - **extend liquid manure pipelines**
  - **export surplus solids to forage**
  - **divert liquid to solid to facilitate export**
- **Challenges/ information needed:**
  - **Where these can/should be employed**
  - **Whole Farm balance tools to guide producers***
  - **Overall capacity of these solutions***
  - **Transportation and air emission impacts**

****these recommendations apply to all workgroups and are not repeated in subsequent slides***

Task Force Work Groups

- **Compost:** Process raw manure to facilitate export and increase economic value of product
- Circular economy for N: Yes
- Challenges/information:
  - Air permitting due to VOC and ammonia emissions (need clear producer guidance and more certainty on control measures)
  - Little experience with most likely control strategies (covers/aerated static piles) and unknown costs for implementation and compliance
  - Capturing value via certification
  - Transportation and air emissions impacts
  - Overall market capacity given increasing supply from other sectors

Task Force Work Groups

- **Denitrification:** Technologies that convert ammonia/ammonium, nitrate or organic nitrogen to harmless N_2 gas
- Circular economy for N: No
- Examples:
  - Vermiculture (BioFiltro)
  - Algae raceways (Bennett Environmental)
- Challenges:
  - Doesn't fully address desire for 'circular economy'

- Limited implementation on dairies, lack of environmental and economic data (only one full-scale vermiculture system in U.S., one pilot algae raceway with moving bed bioreactor in CA)

Task Force Work Groups

- **Nitrogen Capture:** Technologies that capture manure nitrogen and convert manure into value-added products that can be exported from the dairy and used on non-forage crops.
- Circular economy for N: Yes
- Examples:
  - Sedron Varcor
  - Polymer/flocculant-based separation
- Challenges:
  - Varcor: only one system operating on a U.S. dairy (IN), two others planned in CA and FL
    - Likely to only be economical on large dairies, at least in near term
    - Organic status of product being challenged
  - Other technologies “capture” but do not increase value of manure, making export logistics/economics difficult

Recommendations – Conventional Strategies WG

- Implement the Reporting Structure outlined in the SRMR, including whole-farm balance*
- Increase dairy industry and extension education and training to promote producer and consultant understanding of how to apply conventional or innovative strategies to address nitrogen surplus*
- Conduct near-term studies to understand how much of the nitrogen surplus can be addressed using conventional strategies

**Applies to all work groups.*

Recommendations – Compost Work Group

- Develop scenarios using San Joaquin Valley Air Pollution Control District calculator to help determine the control measures (BACT) likely required at different production levels
- Conduct an economic and supply/demand analysis of dairy manure compost
- Develop tools to educate dairy producers on permitting requirements and control technologies for composting
- Evaluate existing information and research gaps on environmental impacts (air quality, GHG, water quality, etc.), transportation impacts and cost, and food safety issues.

Recommendations – Denitrification Work Group

- Conduct economic and environmental outcomes studies on both existing California and Washington vermifiltration systems. *All studies to be independent**
- Build and study two additional pilot projects utilizing vermifiltration in California: one with a digester in front of the system, and one without a digester.
- Educate dairy operators on availability of Alternative Manure Management Program (AMMP) funding for vermifiltration.
- Construct full-scale algae raceway at a specific California dairy location, where a tank digester designed to work with that raceway is already planned and funded.

** Applies to all MRIP recommendations.*

Recommendations – Nitrogen Capture Work Group

- Fund construction of an evaporative liquid waste processing project in California
- Conduct crop trials, using manure/ammoniated liquid extract and solids from an existing evaporative liquid waste processing facility to verify and support its use as an amendment in certified organic agriculture and other agronomic/environmental benefits
- Conduct environmental and economic studies of an evaporative liquid waste processing system to ensure its viability in California.
- Study existing polymer separation/flocculant-based systems including potential for economically viable products
- Develop a concept and budget to construct a full-scale polymer-separation pilot facility; include development of revenue streams and value-added products

Next steps

- Develop more detailed project descriptions, timelines and budgets
- Discuss process for continued MRIP work/stakeholder discussions and progress reporting beyond 2022
- Complete final report (Q3 2022)

Questions/discussion