Integrated Air Quality/Energy Planning for Sustainable Farming/Ranching Systems

Linda Scheffe – John Tunberg

NM/AZ Air Quality/Energy Training

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We’ve achieved a lot, but we must all do a better job

This is our chance, maybe only chance, to really achieve sustainability
Sustainable Farming/Ranching Systems must consider and integrate:

- Soil Quality
- Water Quality
- Nutrient and Salinity Management
- Cropping Systems, incl. Cover Crops
- Irrigation Water Management and Systems
- Integrated Pest Management
- Livestock and Wildlife
- Energy and Air Quality
- Economics
- Whole Farm Planning
- Watershed, Marketing Opportunities
Potential Benefits: Sustainable Systems

- **Soil Resource** – improved soil quality, reduced wind and water erosion
- **Water Resource** – Increased efficiency, reduced costs, water losses minimized
- **Plant Resource** – increased yields, improved quality, reduced pest incidences
- **Other** – Reduced overall on-farm energy use, increased beneficial use and recycling of nutrients
Use systems approach
Think Resource Efficient
Think On-site and Off-site Effects
Plan Creatively and Flexibly. Step Outside Box
Technology Exchange not Transfer
Achieving Sustainable Farming/Ranching

- Form interdisciplinary, interagency team, producer networks to identify/resolve resource problems/opportunities.

- Producers are the drivers of sustainable farming as we develop/exchange technologies, case studies, field trials, on-farm demonstrations, farmer-to-farmer networks.

- Need user friendly fact sheets, brochures, assessment tools on integrated systems.
Achieving Sustainable Farming/Ranching

- Keep energy flow through the integrated system, close loop
- Reemphasize biological factors, improve biodiversity
- Improving soil quality is basis for improving soil, water, air, plant, animal, human, and energy resources
Sustainable Farming – Build Soil Quality

- Minimize or eliminate tillage
- Apply nutrients according to soil, water, plant tissue tests and nutrient budget
- Increase on-farm nutrient cycling, plant species diversity
- Maintain ground cover year round by using cover crops and mulches and by leaving crop residues in field
- Manage/protect soil organisms to preserve biodiversity
Sustainable Ranching – Build Soil Quality

• Optimize plant production aligned with environmental conditions
• Promote diversity of species with different rooting depths and patterns
• Protect soil from erosion by reducing bare soil patch size and connectivity
• Manage grazing, fire, vehicle use to maximize growing plant cover and roots
Sustainable Farming/Ranching – Develop Conservation Plan

- Use integrated approach to inventory resources and develop conservation plan for whole farm
- Choose and apply conservation practices, technologies, approaches to address identified resource concerns and take advantage of opportunities
- Not only think outside the box but step outside the box
Sustainable Farming/Ranching – Maximize Biodiversity

- Integrate crop and livestock production
- Use hedgerows, insectary plants, cover crops, etc. to attract beneficial insects, bats, and birds
- Plant trees and perennial crops
- Abandon monocropping in favor of crop rotations, intercropping and polycultures
- Manage pastures to support diverse selection of forage plants
- Plant cover crops
Integrated Air Quality/Energy Planning

• Air Quality – Atmospheric Resource Quality Assessment Tool: New Mexico NRCS Air Quality Tech Note 1; 
  http://www.nm.nrcs.usda.gov/technical/tech-notes/air.html

• Decision tree to help planners and producers assess whether or not they have air quality/atmospheric resource issues/concerns and then how to address that issue/concern.

• Need to revise after this training to incorporate energy opportunities
Common Ag Air Quality Issues - NM

- Prescribed Burning of rangeland, pasture, pecan piles (Nov. through March), cropland field ditches, wheat residue
- Wind Erosion from farmers still doing tillage operations in 30 mph winds or better, dirt roads, overgrazing
- Odors and dust from CAFO operations (dairy and beef) – CNMPs are planned to Resource Management System level
Selected NRCS Air Quality Funding Opportunities – be proactive

• EQIP and Air Quality EQIP Priority Areas – Dona Ana County
• Air Quality CSP Enhancements
• CIGs
• CNMPs
Renewable Energy (Solar, Wind, Biomass, Biofuels) – Dr. Ghassemi will cover

Solar, algae, biobutanol, cellulosic bioethanol, and biodiesel technologies are not yet price competitive – research/demo phase, some exist with incentives, Pecos biomass project example

Wind is very competitive if power lines are nearby

On-Farm/On-Ranch Conservation (Stephanie will cover)
Wind Energy Opportunities - NM

• NM ranks 14th in wind power capacity, but 5th for wind power utilization
• Large-scale wind farms (500MW) could generate 20,000MW (more than enough to meet state’s needs)
• Right now, NM generates <1,000 MW.
• Existing farms include: Clovis (2MW), San Jon (80MW), Elida (120 MW), House (204 MW), Santa Rosa (220 MW), Gladstone (20 MW), and Clayton (120 MW).
Wind Energy Opportunities - NM

- Corona Ranchers in Torrance County – by collectively bargaining for land leases, they can match the value of raising cattle (per acre basis)
- Wind Research and Training Center is unique in the nation
Promoting On-Farm/On-Ranch Conservation Energy Opportunities - NM in Learning Phase

- Incorporating energy into conservation practice standards, planning process
- Producer and agency Sustainable Ag Workshops across state, forming partnerships
- Tech notes, fact sheets
- On-farm/on-ranch case studies/demos/workshops
- Conservation Innovation Grants funded
- EQIP
- CSP Enhancements
- RC&D Projects
- Discussing more in brainstorming session