

Nutrient Management Project Protocol (NMPP)



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Workgroup Meeting #2

June 27, 2011

12 – 2 pm PDT



Agenda

- Review timeline
- Preview of background paper research
 - Nutrient management practices
 - Fertilizer use trends
 - Data available to assess common practice
- Discuss performance standard conceptual framework (not covering legal constraints)
- Next steps



Protocol Development Timeline

Methodology Synthesis Paper	May 6, 2011
WG Meeting 1 (conference call)	May 18, 2011
WG Meeting 2	June 27, 2011
Background Paper Completed	Expected July 6, 2011
Draft protocol to workgroup	Week of July 25, 2011
WG Meeting 3 (Los Angeles)	August 1, 2011
Second draft protocol to WG and SAC	Week of Aug 29, 2011
Science Advisory Committee Meeting	September 7, 2011
WG Meeting 4 (conference call)	Week of Sept 12 or 19, 2011
Revised protocol & start of 30-day public comment period	November 1, 2011
WG Meeting 5 (conference call)	Week of November 14, 2011
Public workshop	Week of November 28, 2012
Protocol adoption by Reserve Board	February 2012



Background Paper

- Definitions of nutrient management practices
- Additionality research
 - Related legal constraints, review of data on common practice, recommendations on performance standards
- Review of relevant GHG sources and sinks
- Information on environmental credit stacking (phase II)
- Review and comparison of GHG accounting in existing methodologies
- Recommendations on the use of biogeochemical process models (phase II)



Nutrient Mgmt Practices

- Reducing annual N application use rate
- Changing timing of N fertilizer application
 - Apply nutrients no more than [30] days prior to planned planting date
 - Apply [50%] or more of the total N needs after crop emergence
 - Split application technology and management
- Changing N source
 - Changing fertilizer composition
 - o Change chemical composition (e.g., anhydrous ammonia to urea)
 - o Change to controlled-release nitrogen fertilizer
 - Use of nitrification and urease inhibitors
 - Replacing inorganic fertilizer with organic amendments
 - o Partially replacing inorganic N application by manure
 - o Partially replacing inorganic N application by compost
 - o Complete transition to Organic Cropping Systems



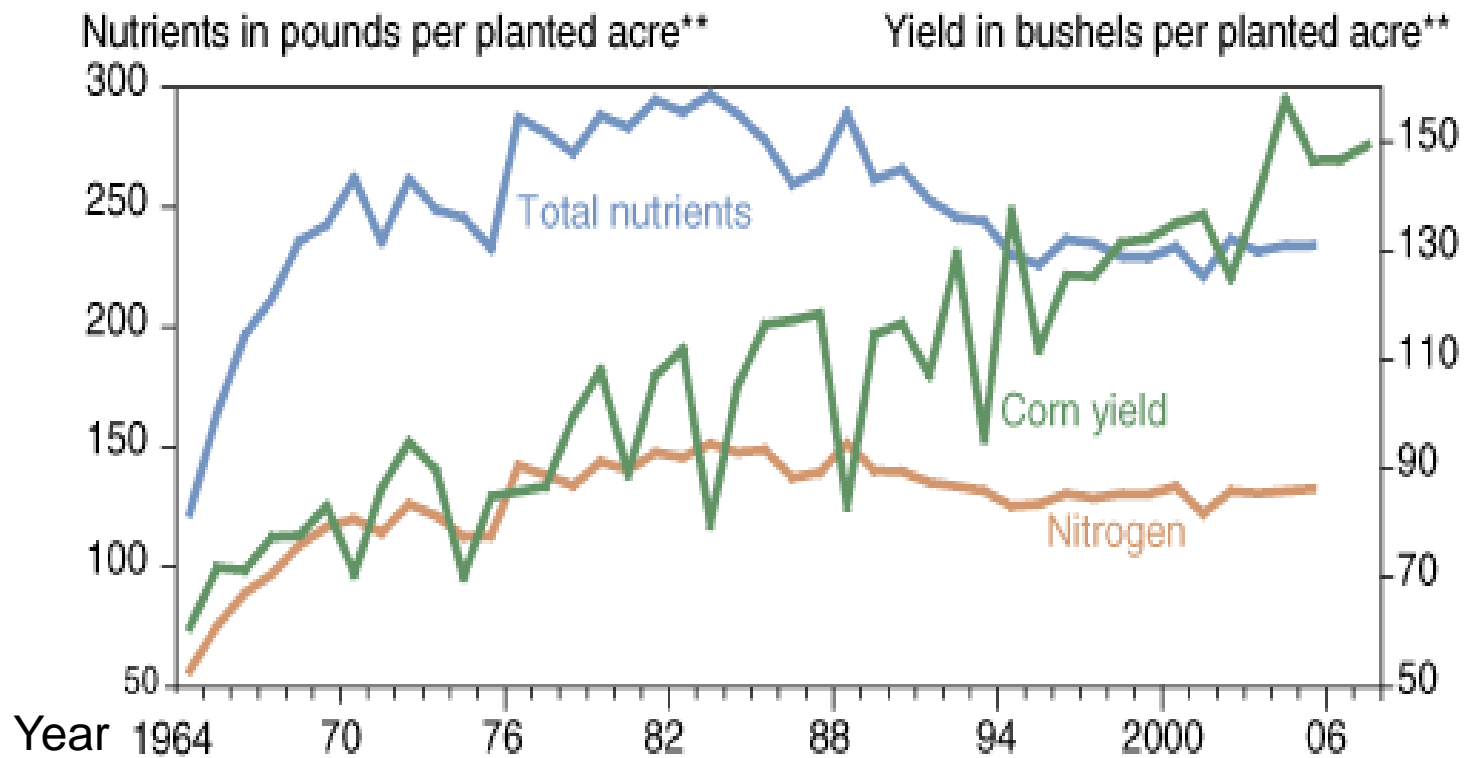
Nutrient Mgmt Practices

- Changing Placement of N application
 - When seeding
 - From broadcast to banding
 - Rate modification for different areas of field based on yield expectations (e.g. precision agriculture w/ GPS)
 - In sub-surface drip irrigation (fertigation)
 - Injection to root zone
- Including mixed cover crops in a rotation
 - Plant a cover crop to absorb residual nitrogen post-harvest
 - Use of legume cover crops as a nitrogen source
- Adding deep rooting plants into crop rotations (e.g. alfalfa or other hay plants)

Fertilizer Trends: US Corn

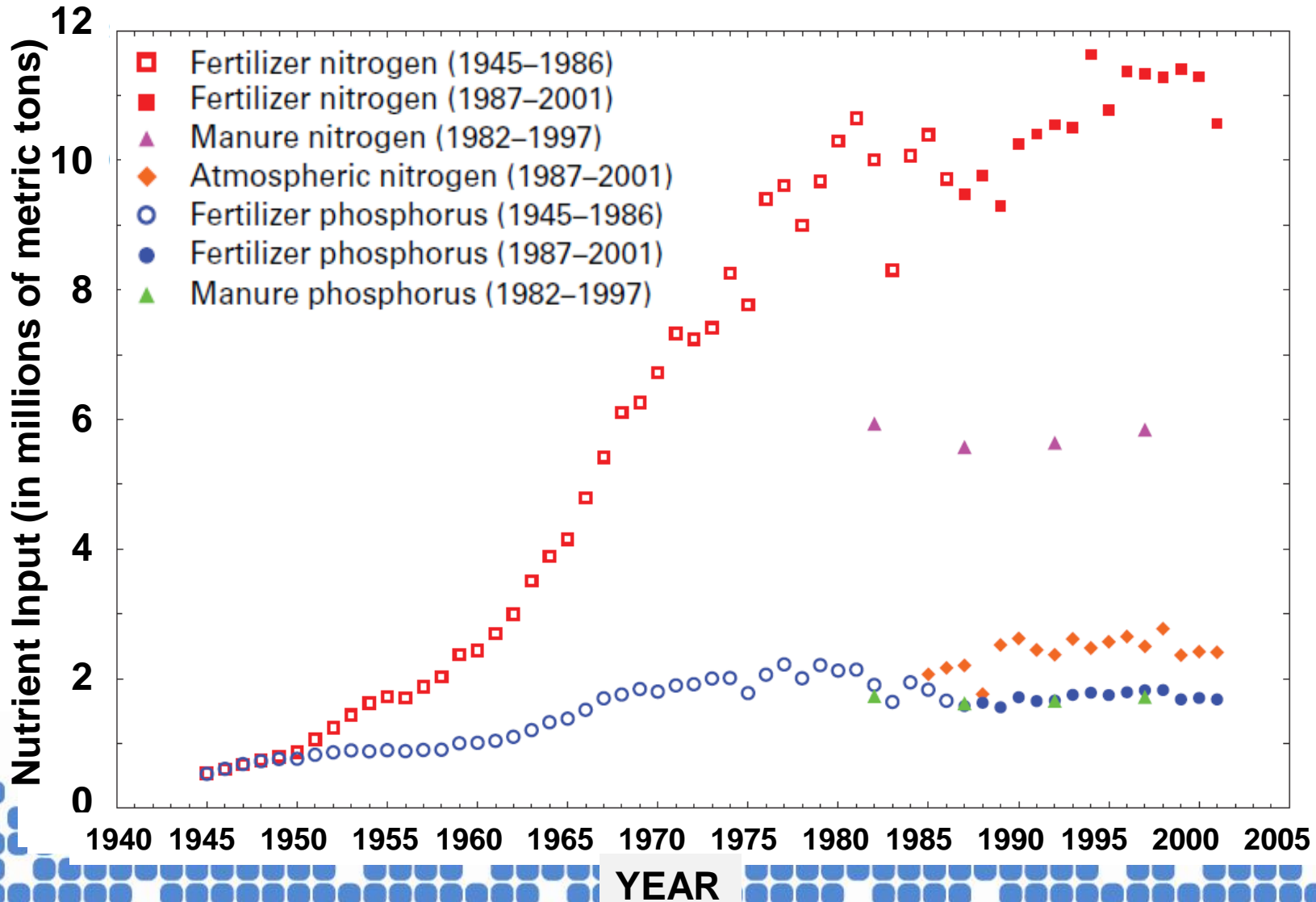


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Fertilizer Trends: US Total





Fertilizer Price and Use

- Fertilizer price increased 300% in past 10 yrs
- In US, fertilizer use is price-inelastic mainly due to lack of economic substitutes to synthetic fertilizer.
- Fertilizer application rates are likely to remain unchanged in the US during 2010 - 2025, even if N fertilizer prices and demand for agricultural commodities increase (Rosas 2011)
 - Global crop production, demand, and fertilizer use models; WorldNPK linked to FAPRI ag production model

Common Practice Data:

Are data available to approximate “common practice” for nutrient management?



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Type of Data	Data Sources
USDA surveys	<ul style="list-style-type: none">• NASS Agricultural Chemical Use Program• NASS Annual Surveys (yields, acres, state-level expenses)• NASS 2008 Organic Survey• Economic Research Service (ERS) Fertilizer Use and Price Datasets• ERS Indices of historic consumption by state (1960-2004)
Fertilizer sales data & derived fertilizer use data	<ul style="list-style-type: none">• Association of American Plant Food Control Officials (AAPFCO) annual fertilizer sales data (county-level for 75%, otherwise state-level)• EPA report on N types, using AAPFCO sales data (dated – 1999)• USGS county-level estimates of fertilizer N and manure use, derived from AAPFCO sales data• State Dept of Ag collection of sales data at county level (e.g. CA)
State surveys	<ul style="list-style-type: none">• MN Farm Nutrient Management Assessment Program• CA Statistical Review of Organic Agriculture• WI Nutrient Management Survey for Dairy Farms
Expert opinion surveys	<ul style="list-style-type: none">• California – UC Davis Cost and Return Studies (surveys of producers and/or extension staff)
N rate calculators based on yield goals	<ul style="list-style-type: none">• Agricultural Extension Specialists and Universities (e.g. Iowa State); typically a look-up table or simple web-based calculator



Common Practice Data

- Fertilizer application rate
 - Multiple options available that span various geographic scales
 - Crop-specific data are only widely available at state level
 - County or multi-county scale information is available for only some regions and is not crop specific
 - Recommended N rate calculators could be used but require data on yields and may not be strong indicators of actual practice
- Type, timing, placement, and source
 - Less widespread data availability
 - At least some promising resources were found
 - May be enough available to develop performance standards for main crop growing regions and California



Performance Standard Conceptual Framework



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- (1) Project fertilizer application rate must be below the determined threshold for a region/crop, regardless of pre-project application rate:
 - Data sources and stringency thresholds TBD
 - Purpose is to ensure projects achieve a certain *level* of performance; is *not* to determine the baseline
 - Baseline quantified using data on site-specific historic rates

Performance Standard Conceptual Framework



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(2) And, projects must adopt at least [2] practices from standards specified by region/crop, e.g.:

- Apply at least [30%] of N from organic sources
 - Plant a mixed cover crop for at least [4] months to immobilize N outside of the growing season and supply N during growing season
 - Supply at least [50%] of N within [30] days of planting
 - Use nitrification and urease inhibitors
 - Install and use fertigation system
- Standards to be developed by Reserve with WG input
- Thresholds should represent better than common practice
 - Limited data available, significant effort to develop

WG Reaction & Input on Conceptual Framework



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- General reactions, questions, or concerns?
- Advice on fertilizer rate data resources
 - Are we missing any data resources?
 - Thoughts on which data source(s) to use?
 - What level of performance should thresholds represent?
- Advice on resources for other practice standards?
 - Other sources like the UC Davis cost and return studies?
 - Suggestions of how to rapidly collect similar data?



Next Steps

- Complete and circulate Background Paper to WG
- Begin targeted development of performance standards
- Protocol draft to workgroup before in-person meeting
- In-person meeting on August 1, 2011
- WG written comments on draft protocol by August 16, 2011
- Revised protocol to WG and SAC by August 29, 2011



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Thank you!

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