IAMP-Compost and Manure Application Practice (within NRCS 590)

Description: Compost and manure are carbon-based amendments derived from animal byproducts with or without plant materials. Compost is a product created through the controlled aerobic, biological decomposition of plant and animal materials. Manure can also be composed of both plant and animal materials that have not been managed for biological decomposition (e.g. fresh scraped manure or stockpiled manure). Both products have plant-available nutrients, such as nitrogen, phosphorus, and potassium, that need to be accounted for in a nutrient management plan. The emphasis in IAMP is on the reduction of synthetic N fertilizers, a greater reliance on organic sources of N and improving N use efficiency. Incentives are provided for management that replaces at least 15% of the typical baseline synthetic inorganic N demand with organic compost and/or manure sources without exceeding the Idaho State Department of Agriculture Phosphorus (P) limits on cropland.

Benefits: Compost and manure supply nutrients to plants and microbes in addition to carbon. They can reduce soil bulk density and overall soil structure.

Soil Health Benefits: Manure and compost additions will likely lead to increased soil carbon and potentially less impacts on soil pH as compared to synthetic fertilizers

Considerations for Success:

- If equipment is not already owned or readily available, producers may need to hire a custom applicator to apply compost/manure.
- If the field is located far from a composting facility and/or higher application rates are used, the cost of compost could exceed incentive payment.
- Application plan must consider and avoid the accumulation of excess soil salts, P, and Potassium (K).

Options: See NRCS Nutrient Management (590) guide and/or NRCS Soil Carbon Amendment (Code 336 or 808).

IAMP Preferences/Considerations: The IAMP project incentivizes practices that improve soil health and reduce reliance on synthetic nutrient inputs. Practices that optimize phosphorus or other nutrients that do not have any clear direct impact on soil microbial health would be better supported by other programs (e.g. EQIP and CSP). Manure and compost additions to cropping systems should focus on the four R's (Right Source, Right Rate, Right Timing of Application and Right Place). Developing a nutrient management plan for a field and implementing these plans, can require yield maps, remotely sensed imagery including near-infrared technology (NDVI/NDRE), soil testing. The IAMP project will provide some level of technical support and training to assist in developing these nutrient management plans, however we encourage producers to work with crop consultants or NRCS planners with experience developing these plans to assist in the development of these plans appropriate for the particular field identified for this program.

Specific Details:

The IAMP project follows NRCS guidelines which require that combined compost/manure and synthetic fertilizer to be applied at rates that are less than or equal to University of Idaho fertility guide recommendations for the specific crop and region. The IAMP project must also ensure that water quality risks are assessed and accounted for using the state water quality risk assessment tool. IAMP partners and technical team representatives will be available to assist in setting or reviewing nitrogen fertilizer rates and conducting the water quality risk using the following two tools.

1) Nutrient Management Plan: Using the following NRCS spreadsheet 590_ID_GD_Nutrient_Management-Spreadsheet.xlsx to demonstrate both the baseline and proposed fertilizer and compost/manure management strategy. The proposed nutrient management application rates must not exceed University of Idaho fertility guides. The initial agreement will be approved based on producer provided historic fertilizer and compost/manure applications rates, actual or estimated pre-plant soil nitrogen. Each year following implementation of the practice planners will ensure nitrogen reduction was at least 15% based on actual soil tests and compost/manure analysis taken as a part of the IAMP practice and that the actual fertilizer rates did not exceed University Idaho fertility guides. Producers will be responsible for taking pre-plant soil samples at the 0-1 ft and 1-2 ft depths in the enrolled field and provide an assessment of nitrogen availability in the compost/manure from a sample taken prior to application; Refer to the IAMP Soil Sampling Protocol for details. At a minimum, soil samples should be analyzed for organic matter, nitrate, and ammonium. IAMP encourages growers to do a more complete fertility analysis of the soil samples, especially if has been several years since the soil sample was taken and analyzed. For an overview of all required sampling for each IAMP practice, see IAMP Crop/Soil Sampling Matrix.

2) Water Quality Risk Assessment: Use the INTRA (Idaho Nutrient Transport Risk Assessment) tool INTRA_041514.xlsm to ensure the proposed practice does not pose a risk to water quality. Any recommendations by the INTRA analysis need to be addressed to meet NRCS compliance and must be included in the plan.

Documenting Impacts of Nitrogen Reduction on Crop Performance:

The IAMP project highly encourages producers to quantify impacts on reduced nitrogen fertilizers on crop yield, quality, and nitrogen use efficiency which could be ***potentially beneficial marketable information***. A simple approach is to include a baseline strip in the field where fertilizer is applied at a rate that typically has been applied in previous years to compare with the rest of the field that is receiving a reduced fertilizer rate. If these strips are greater than 60 ft wide, then IAMP technical teams can work with the grower to utilize satellite remote sensing to track differences in crop production through the growing season. A more ambitious approach might be to incorporate multiple strips which a range of nitrogen fertilizer rates. Producers with yield monitors can directly measure differences in yield. Post harvest soil samples analyzed for nitrate and ammonium at one-foot intervals to a depth of 2 feet can provide valuable information on nitrogen use efficiency and can be a good indicator of potential nitrogen stress. IAMP technical teams can assist in analyzing these data and providing a useful certified report that can be a value-added product to that commodity.

Verification Required Prior to Payment:

- Confirmation that state requirements and regulations have been followed when applying nutrients near areas prone to contamination, such as designated water quality sensitive areas, (e.g., lakes, ponds, rivers and streams, sinkholes, wellheads, classic gullies, ditches, or surface inlets) that run unmitigated to surface or groundwater.
- Soil testing for nutrient management confirmations:
  - For an overview of all required sampling for each IAMP practice, see IAMP Crop/Soil Sampling Matrix.
  - Provide soil sampling results for the land parcel that will receive reduced rates. Refer to the IAMP Soil Sampling Protocol for details.
  - Statements or other documentation (e.g. as-applied maps, receipts) that demonstrate fertilizer and manure/compost rates and materials applied where within the recommendations described in the nutrient management plan for the field (e.g. at least 15% replacement of synthetic fertilizer application rates with manure or compost).
  - If applicable, provide in-season tissue, petiole, or sap testing results that were used to adjust in-season applications of nutrients, if this occurs prior to the Agreement end date.
- Manure testing and application rate confirmations:
  - Provide manure testing lab results with carbon and nutrient analysis.
  - Manure/compost application rates, date of application, methodology, and manure testing results.
- Water quality risk assessment using INTRA (Idaho Nutrient Transport Risk Assessment) tool (INTRA_041514.xlsm) completed and recommendations addressed to meet NRCS compliance.
- Crop yield maps (if available)

IAMP incentive Payments: $60/acre for compost or manure, in each case to replace 15% of inorganic N applications from baseline rates. An additional $1 per acre for every additional 1% replacement of inorganic N applications beyond 15% up to a maximum of 50% (i.e. maximum payment of $95 per acre at a 50% replacement). Incentives will also be added to include funding to cover the additional soil and manure lab analysis costs.

Stacking or Companion Practices: Manure and compost fertilizing is compatible with other incentive IAMP practices: Cover crops, Conservation crop rotation (>2 crops), Intercropping, No tillage from conventional, Reduced tillage from conventional, Prescribed grazing, Soil carbon amendment (Biochar). A caveat for stacking with the no-tillage practice is that only compost should be used (N losses from unincorporated manure would be high), and only at lower rates and in areas not prone to runoff. Stacking as part of a reduced total N application is encouraged.

Sources:

NRCS Nutrient Management (590)

NRCS Soil Carbon Amendment (336)

4R Nutrient Stewardship

Certified testing laboratories

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