

## **IAMP-Nutrient Management with N reduction (NRCS Code 590)**

**Description:** Nutrient management is a strategy employed to match the amount and timing of nutrient applications to the temporal and spatial needs of a crop. The emphasis in IAMP is on the reduction of synthetic N fertilizers and improving N use efficiency. Incentives are provided for management that reduces applied N during a specific cropping year by at least 15% below the verified baseline. Producers must ensure nitrogen fertilizer rates do not exceed University of Idaho fertility guides for the specific crop ([UI fertility Guides](#)) based on fertility analysis of pre-plant soil samples and/or analysis of petiole samples taken from the field. By focusing on reduction from 'baseline' practices, the IAMP project encourages those without any nutrient management plan to start following fertility guides. Producers who already follow UI fertility guides and interested in exploring other opportunities to further reduce fertilizer rates through more advanced strategies (e.g. variable rate fertilizer, N-inhibitors, slow-release fertilizers, sap analysis, and other suggestions in [Idaho NRCS 590](#) ) can also receive incentive payments as long as there is a clear 15% reduction from baseline practices.

**Benefits:** Optimizes fertilizer efficiency and crop yields; minimize agriculturally based nonpoint source pollution to surface and groundwater; minimizes legacy effects to soil health including soil acidification; reduces input costs to a producer; supports efficient nitrogen cycling and reduces nitrogen losses to the environment.

**Soil Health Benefits:** Nutrient management practices will likely lead to increased soil carbon if the strategy results in increased crop biomass. Whether crop biomass increases will depend on the crop, the baseline nutrient management and baseline biomass of the crop.

### **Considerations for Success:**

- Use realistic yield targets and available information on nutrient use efficiency to aim for economically optimum application rates.
- It is not in the interest of the IAMP project or from a producer perspective to reduce crop yields; however, a reduction of fertilizer could result in reduction in crop yield. Incentive payments are geared to assist producers in accepting this risk; however, the IAMP program will not be covering yield losses. Developing a proper management plan should help to minimize the risk of nutrient management strategies on crop production.
- Equipment for variable rate is expensive, and the project cannot underwrite those costs. If employing a variable rate fertilizer strategy, producers may need to hire a custom applicator with the technology to apply variable rate zones.
- Modifying the timing of fertilizer may require additional labor and field costs over traditional practices.
- The type of fertilizer employed (particularly slow-release fertilizers) may be more expensive.

**IAMP Preferences/Considerations:** The IAMP project particularly encourages practices that improve soil health and optimize nutrient use efficiency. 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). IAMP will require a nutrient management plan like the NRCS requirement but simplified to focus on improved nutrient efficiency within the boundaries of a field rather than a

complete farm plan that considers nutrient budgeting for the entire farm. The IAMP Implementing Partner representative will work with the enrolling producer to develop this plan.

### **Specific Details:**

The IAMP project follows NRCS guidelines which require applied fertilizer rates to be applied at a rate that is less than or equal to University of Idaho fertility guide recommendations for the specific crop and region. The IAMP project must also ensure 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 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 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 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.
  - 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)

**Incentive Payments:** \$55/acre for each year of implementation with  $\geq$  %15 reduction in N below baseline for the specific crop in the rotation. An additional \$1 per acre for each additional 1% reduction beyond 15% up to a maximum of 50% (i.e. maximum payment of \$90 per acre at a 50% reduction). Incentives will also be added to include funding to cover the additional soil and manure lab analysis costs.

**Stacking or Companion Practices:** These practices are compatible with other incentivized IAMP practices: Biochar, Cover crops, Conservation crop rotation (>2 crops), Intercropping, No tillage from conventional, Reduced tillage from conventional, Prescribed grazing, Soil carbon amendment.

**Sources:**

[NRCS Nutrient Management \(590\)](#)

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