Probabilistic Indexes for Phosphorus Losses. (S06-potter112640-Oral)

Authors:

- J.Sanabria - *Blackland Research Center*
- S.Potter - *TAES-Blackland Research Center*
- J.Atwood - *USDA-NRCS, Temple, TX*
- J.Lemunyon - *USDA-NRCS, Fort Worth, TX*

Abstract:

The National Nutrient Loss Database includes 16 crops covering over 150 million hectares of U.S. cropland and was populated with 1.1 million EPIC simulation model runs using data developed from agricultural surveys and the National Resources Inventory. Statistical clustering techniques were used to define 38,000 cropland model units that capture the variability in soil, weather, irrigation method, and conservation practices that are expected to effect P losses. For each model unit, 30-year simulations were made for three tillage systems and various nutrient and manure treatments. A probability based Phosphorus Loss Risk Index (PLRI) will be estimated from the combination of factors and the variability is apportioned between random and fixed factors. A theoretical probability distribution model will be fit to the P losses from 30 years and probabilities associated with critical values of P loss thresholds are estimated. The probabilities of occurrence of the fixed factors are calculated using the classical definition of probability. The final PLRI in a particular location will be obtained adjusting the modeled probability value by the series of probabilities from the fixed factors using the Rule of Elimination theorem.

Corresponding Author Information:

Steven Potter
Texas A M- Blackland Research Center
808 E. Blackland Rd.
Temple, TX 76502
USA

phone: 254-774-6111
fax: 254-770-6561
e-mail: spotter@brc.tamus.edu

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