RUSLE 2 AND WHAT IT MEANS TO NUTRIENT MANAGEMENT PLANS

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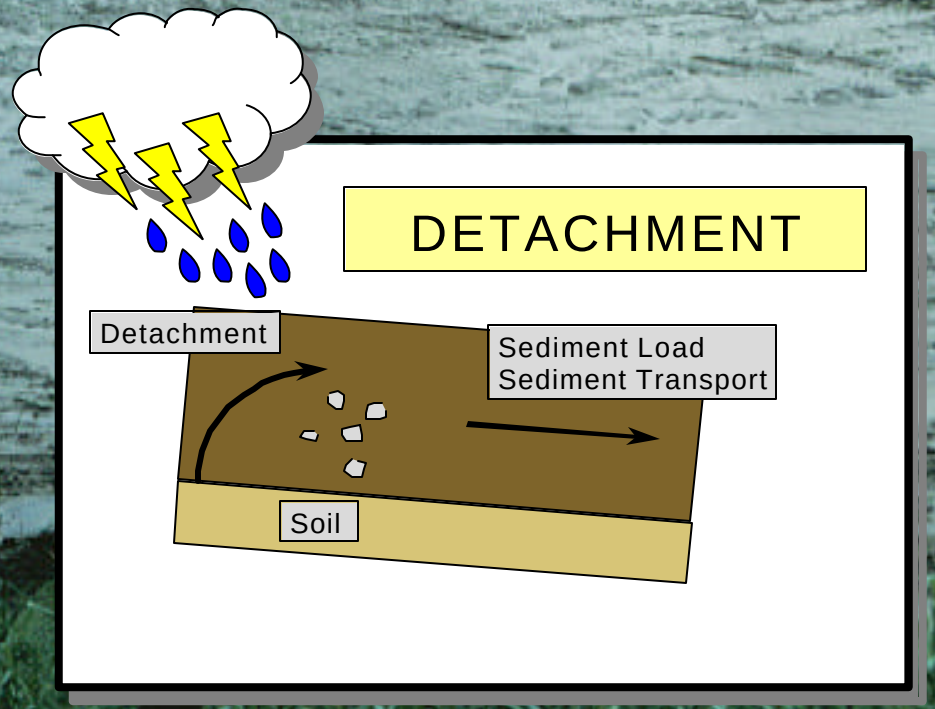
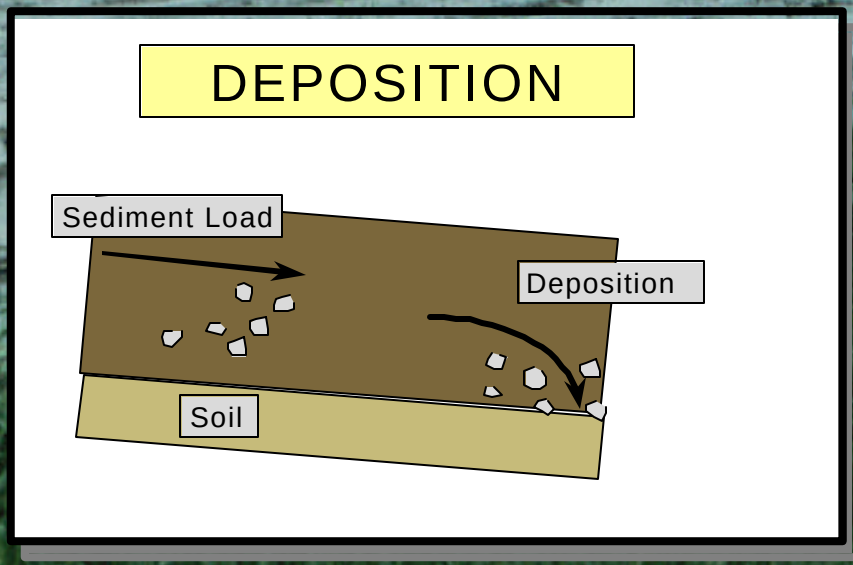
EROSION IS A SOCIETAL CONCERN

- DEGRADATION OF THE RESOURCE
  - FERTILITY
  - ORGANIC MATTTER
  - TILTH
- WATER QUALITY
  - SEDIMENT
  - NUTRIENTS
- PROGRAM COST
  - CHEAPER TO PREVENT
  - STILL EXPENSIVE

THE SOIL WATER EROSION PROCESS





PURPOSE OF EROSION AN PREDICTION MODEL

- DEVELOP PLAN REASONABLE PLAN BASED ON SCIENTIFIC INFORMATION
- GUIDE MANAGEMENT DECISIONS
- EVALUATE MANAGEMENT IMPACTS
- DETERMINE PRACTICE COST:BENEFIT
- ASSESS RESOURCE INVENTORY

WHAT IS RUSLE 2

- "GREAT GRANDSON" OF USLE
- MODEL TO PREDICT SOIL LOSS
  - WHERE OVERLAND FLOW OCCURS
  - COMPUTES ANNUAL SHEET/RILL EROSION
  - COMPUTES PARTICLE DISTRIBUTION AND RUNOFF
- CROPLAND, FOREST, LANDFILLS, CONSTRUCTION SITES, SURFACE MINES
- WINDOWS "PULL DOWN" MENUS

WHO AND WHAT OF RUSLE 2

- USDA-ARS, USDA-NRCS, VARIOUS UNIVERSITIES
- ON-GOING PROCESS OVER 70 YEARS
- THOUSANDS OF RESEARCH DATA
- SET UP WITH VARYING LEVELS OF COMPLEXITY
- COMPUTER REQUIREMENTS
  - WINDOWS 98
  - INTERNET EXPLORER BROWSER
  - 64 MB RAM
- DOWNLOAD
  - HTTP://BIOENGR.AG.UTK.EDU/RUSLE2/

CALCULATE SOIL LOSS

$A_{(TON/AC/YR)} = R*K*LS*C*P$

- R = RAINFALL INTENSITY AND AMOUNT
- K = SOIL EROSIVITY
  - TEXTURE
  - STRUCTURE
- LS = SLOPE LENGTH, GRADE, SHAPE
- C = CULTURAL PRACTICES
  - ROTATION
  - TILLAGE
- P = SUPPORTING PRACTICES
  - TERRACES
  - CONTOURS
  - BUFFERS

CROP RESIDUE IS STILL THE BEST EROSION PREVENTION TOOL

- ✓REDUCED DETACHMENT
- ✓HINDERS OVERLAND FLOW
- ✓IMPROVED INFILTRATION

HOW MIGHT RUSLE 2 INTERACT WITH NMP

- FARMS NEED A CONSERVATION PLAN WITH FIELDS AT “T” FIRST
- SATISFY “T” MAINLY BY ROTATION AND TILLAGE
- WILL THERE BE LAND FOR MANURE APPLICATION
- FUTURE USE OF THE P INDEX

CONSERVATION PRACTICES ADD FLEXIBILITY

- ✓CONTOUR BUFFERS
- ✓ROTATION OPTIONS
- ✓COST SHARE $

WHAT TO DO WITH MANURE

- ✓DAILY HAUL AND WINTER APPLICATION
- ✓RATE LIMITED WITH SURFACE APPLICATION
- ✓MANURE = RESIDUE

CONFLICT BETWEEN CONSERVATION AND NMP

- NMP WILL ALLOCATE MANURE TO MORE FIELDS ON A FARM
- SOME MAY BE DIRECTED TOWARD SLOPING LAND
- ROTATIONS AND TILLAGE MAY NOT BE ADAPTABLE TO MANURING
- PLANTING PROBLEMS
- MORE TILLAGE = MORE EROSION AND TOTAL P LOSS

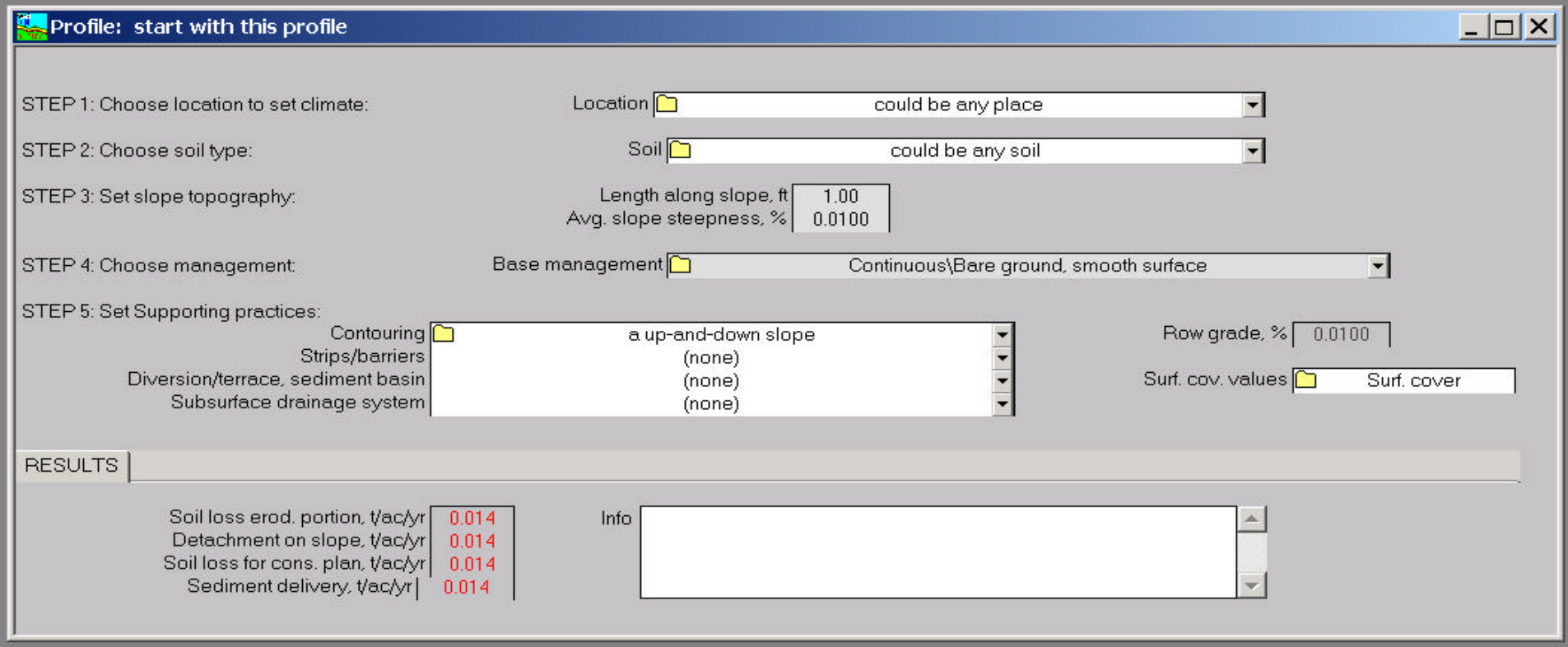
INCORPORATION AFFECTS MANURE MANAGEMENT

- MAY TAKE AWAY AVAILABLE ACRES
- AFFECTS TIME MANAGEMENT
- STORAGE WILL BE NEEDED
- APPLICATION IN SPRING AND FALL
- RELIANCE ON CUSTOM APPLICATORS
- RESIDUE FRIENDLY APPLICATION

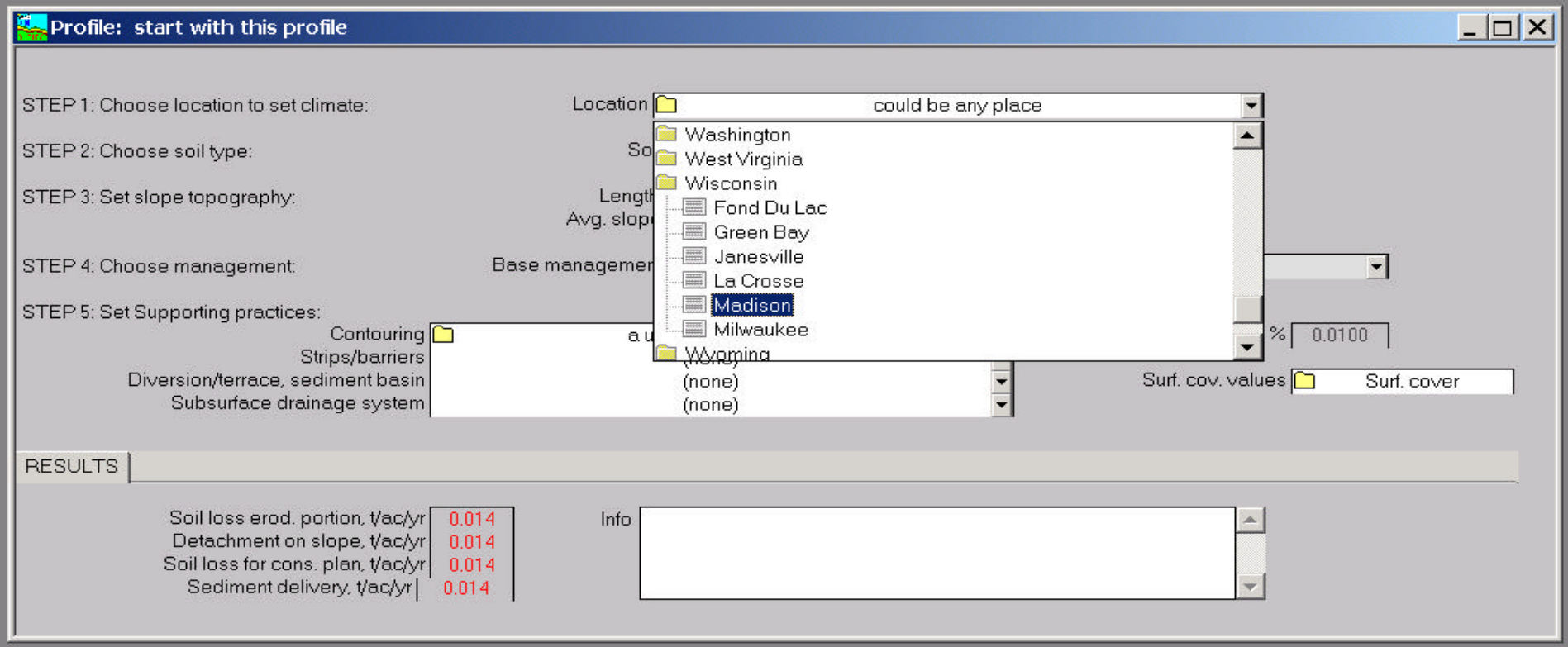
MANURE APPLICATION AND TILLAGE

- ✓48 t/a STRAW DAIRY MANURE
- ✓INCORPORATION BY CHISEL WITH SWEEPS
- ✓39 vs. 57 % RESIDUE

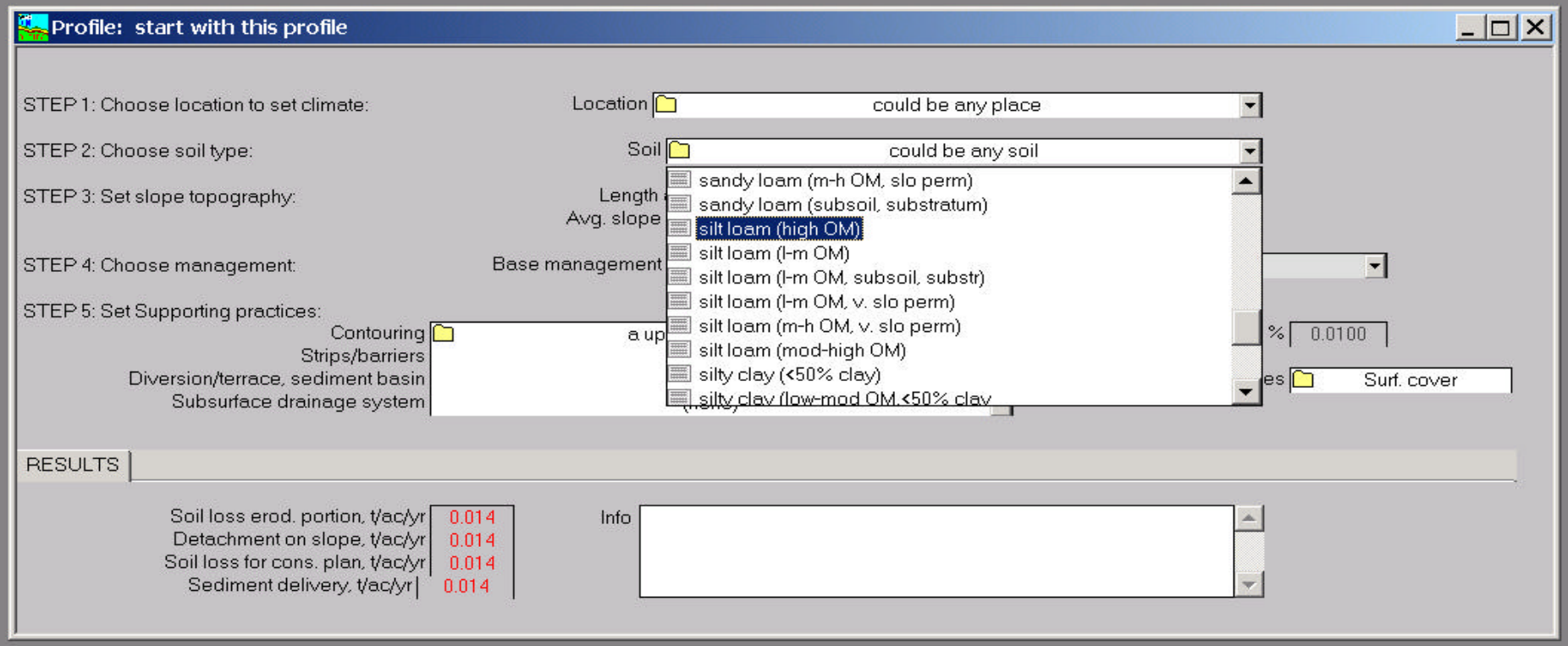
RUSLE 2 – INITIAL PROFILE



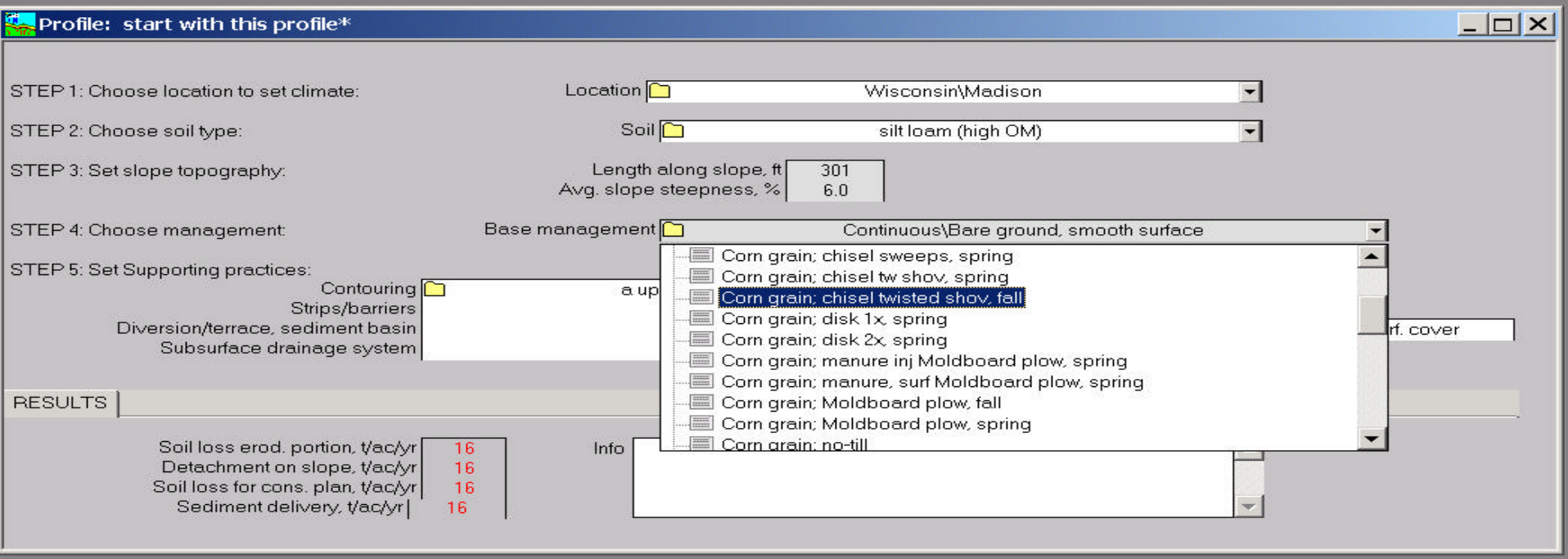
RUSLE 2 – SELECT LOCATION



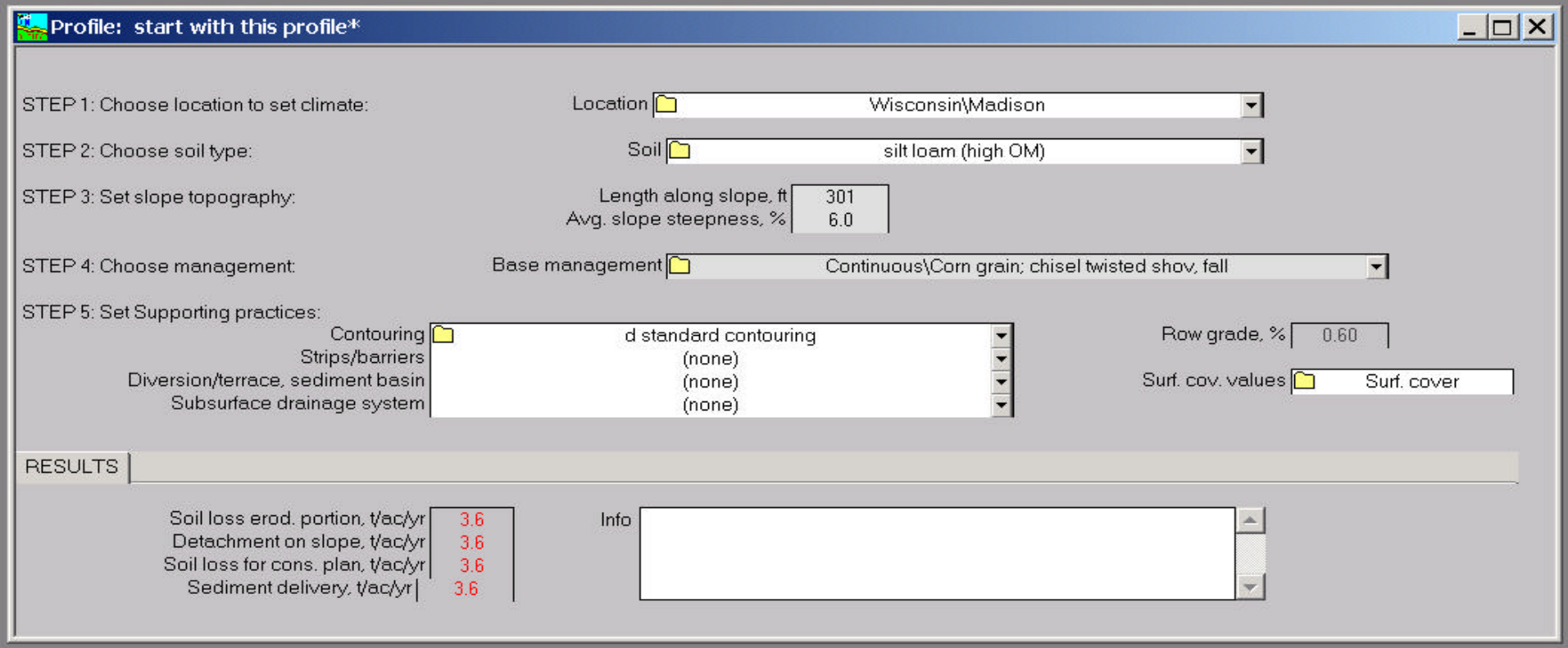
RUSLE 2 – SELECT SOIL



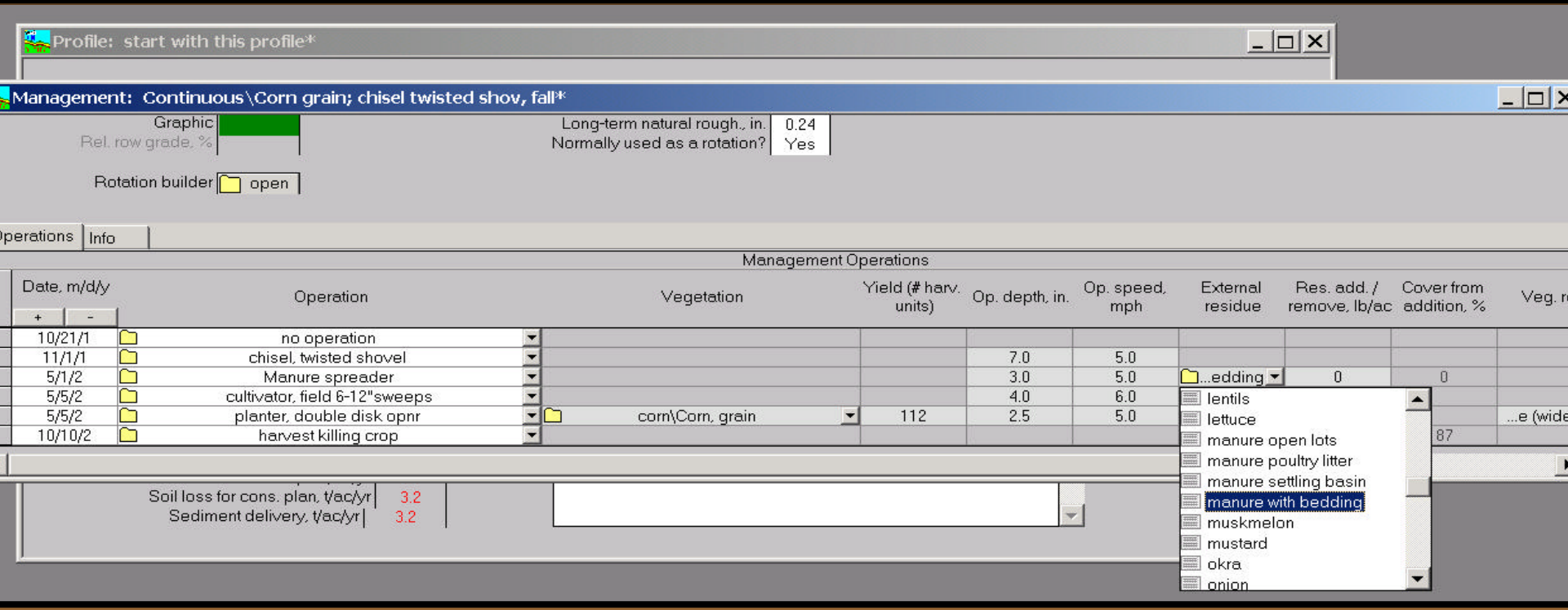
RUSLE 2 – SELECT SLOPE AND ROTATION



RUSLE 2 – SELECT CONSERVATION PRACTICE(S)



RUSLE 2 – "DRILL DOWN" TO FINE-TUNE PRACTICE(S)



CUSTOMIZE THE P INDEX

- RUSLE 2 WOULD BE THE BASE MODEL
- ESTIMATE RUNOFF VOLUME
- TRACK PARTICLE SIZE (CLAY)
- MODEL MOVEMENT OVER ENTIRE LANDSCAPE, NOT JUST A FIELD
- POTENTIALLY P INDEX CALCULATION WILL BE PART OF RUSLE 2

USE THE SYSTEM TO IMPROVE WHOLE-FARM NUTRIENT PLANNING

- RUN P INDEX ON EACH FIELD
- ANALYZE IMPACT OVER WHOLE FARM
- ADJUST NUTRIENT MANAGEMENT TO FIT LANDSCAPE

SUMMARY

- RUSLE 2 APPEARS TO OFFER FLEXIBILITY
- RELATIVELY EASY TO USE
- AVAILABLE TO THE FARMER, CROP ADVISER, EDUCATOR
- NOT READY FOR USE YET IN WIS.
  - NEED CLIMATE, SOIL DATA
- HOPE TO BUILD P INDEX INTO RUSLE 2
- TRAINING SESSIONS THIS SPRING