TECHNICAL NOTES

NATURAL RESOURCES CONSERVATION SERVICE – WYOMING

AGRONOMY NO. 26 **June 21, 2007**

SUBJECT: RUSLE2 User Guide

Although a 2004 User Guide has been available on the official RUSLE2 website: http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm a WY guide was developed for more localized operating procedures. Crop Management Zones for WY are cmz 7 and cmz 9. Both contain the same data and are managed by the WY NRCS State Agronomist. To attain the most current databases, the cmz, soils and climate should be downloaded from this website to your S or C drive/Program Files/USDA/Rusle2/Import folder annually. This guide gives detailed procedures on downloading and importing of databases. If difficulties still arise, contact your Area Agronomist or NRCS State Agronomist.

RUSLE2 is a water erosion program that has an added capacity of calculating the Soil Conditioning Index (SCI) and a STIR value (Soil Tillage Intensity Rating). RUSLE2 is an upgrade of the text-based RUSLE DOS version 1. It is a computer model containing both empirical and process-based science in a Windows environment that predicts rill and interrill erosion by rainfall and runoff.

The Soil Conditioning Index (SCI) estimates the trend in soil organic matter. SCI = OM+FO+ER Organic Matter (OM) is the crop biomass factor of the equation while Field Operations (FO) show the intensity that farm equipment breaks down the OM. Added to this environment the Erosive Factors(ER) or the effect of removal and sorting of soil OM by sheet and rill erosion. A positive SCI rating (zero and above) suggest that soil organic matter levels are predicted to increase under that cropping system. However, a near zero or a negative rating suggests the need for an alternative combination of crop rotations and/or a change in the farm equipment or date of implementation. Soil organic matter levels are predicted to decline under that cropping system.

The Soil Tillage Intensity Rating (STIR) utilizes the speed, depth, surface disturbance percent, and tillage type parameters to calculate a rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The kind, severity and number of ground disturbing passes are evaluated for the entire cropping rotation detailed in the crop management section.

Alternatives:
*Substituting a high residue crop in the place of a low residue crop.
*Delaying the tillage from the fall to late spring reduces the potential for erosion in the critical erosion period. (Commonly wind events occur October through March)
*Replace the moldboard plow operation as a moldboard plow disturbs 100% of surface residue.
*Harvesting corn grain instead of corn silage does increase the residue left on the surface.

RUSLE2

User Manual

March 2007

Revised Universal Soil Loss Equation, Version 2

WATER EROSION

SOIL CONDITIONING INDEX (SCI)

SOIL TILLAGE INTENSITY RATING (STIR)

RUSLE2 ** Water Erosion Calculation ** Soil Quality Rating (SCI)

** Soil Tillage Intensity Rating (STIR) **Fuel Use

Table of Contents 2

Program Set Up 3,4

Database Imports .....
- Management 5-6
- Soils 7,8
- Climate 8,9
  - RUSLE2 Precip Maps Location 11

Climate Database 10

Soils Database 12,13

Crop Management 15-17
- RUSLE2 Crop Management Map 14

Developing a RUSLE Profile 18
- Climate 18
- Soils 19
- Slope and Slope length 19,20
- Crop Management 20-22
- Fuel Use 22
- Irrigation 23
- Editing the Yield 23
- Saving the Management 24
- Soil Conditioning Index 25
  - Adding Wind Erosion 25
  - STIR (Soil Tillage Intensity Rating) 25

Saving the Profile 25
Printing a RUSLE Profile 26,27

Developing a RUSLE Worksheet with Alternatives 27-29
Printing a RUSLE Worksheet 30

Error Report 31
Delete, Rename Database file 32

RUSLE2 101

A different science and technology was used for USLE, RUSLE, and RUSLE2. Data corresponds like apples and oranges. You cannot compare a RUSLE 1.06 calculation with a RUSLE2 calculation. RUSLE2 is the now the only NRCS approved program for water erosion technology. This model is the most accurate reflection of what is actually happening on the landscape. RUSLE should not be used after August 2004. Each fall a new version of RUSLE2 will be deployed. Every year the RUSLE2 program will be updated with a new version. So setup process will need to be completed to be acceptable with NRCS policy of a current erosion prediction.

SETUP IF YOU ARE SETUP , GO THE PROFILE on page 18

After the program has been DOWNLOADED, three data fields in the program are needed to be filled. Those without an S drive will need to complete the following through #1 and #4 (skip #2). These files are located on the website http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm. right click to "Copy to folder" to your C Drive: Program files/ USDA/ RUSLE2/ Import.

1. **Climate Data**: WYclimate030105.gdb
2. **Crop Management Templates**: CMZ 07.gdb or CMZ 09.gdb (See Map on page 14)
3. **Soils Data**: WYsoils020503 zip for the whole state; or one soil survey area
   Fremont County, Wyoming, East Part & Dubois Area.gdb (No more than 6 survey areas)

- **#1**-- Open RUSLE2, Select #2 template to use in middle of screen or at bottom right-hand corner just **left** of moses, right click (default) and **load** template NRCS simple SCI 110606.xml or NRCS simple SCI and Fuel use 1102006.xml. The current version 1.26.6.4 (Nov 13 2006) will be stated top of the screen.

If you work off of a *SHARED NETWORK*, have IT put a folder on the shared drive called Rusle2. Save your Rusle2 folders (Binaries, Export, Import, Printing, Session, Text Users) from your C Drive: Program Files/USDA/Rusle2). ***For NRCS field offices, this has been completed.***

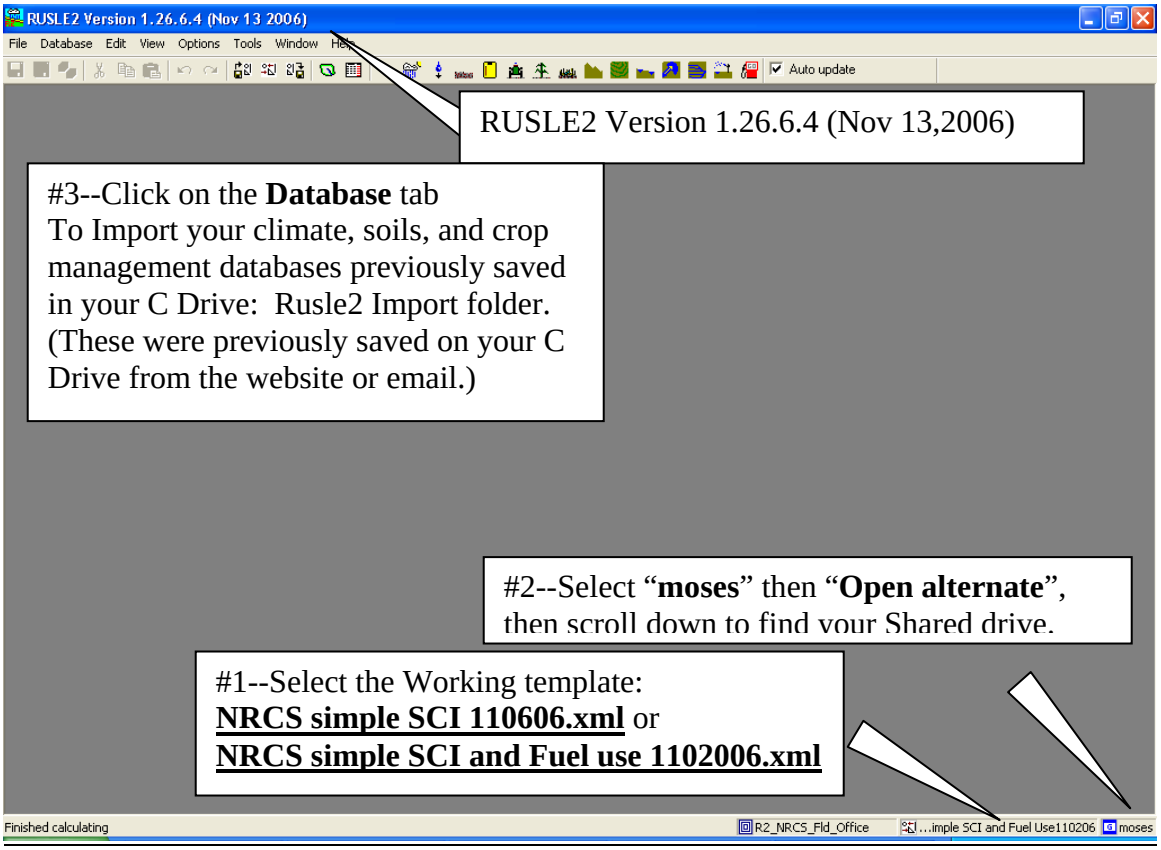
- **#2**--Open RUSLE2 and right click on "moses", bottom right corner, select "open alternate". Look in: find your shared drive Rusle2 folder. Click to open it. Select the "moses.gdb" in the Rusle2 folder. Right click on "moses" again and click Start up Database. Now the climate, crop management templates, and some profiles developed will be saved and available to all in the field office. If your soil survey is not there, you will need to import it in. Click on the **Database tab** at the top. **Import** soils database (see page 4) from your C or S drive folder. **Open**. Select the Soils database by **clicking in the square box** left of the Soil's yellow folder. Click **NONE** and **IMPORT**. OK. OK.

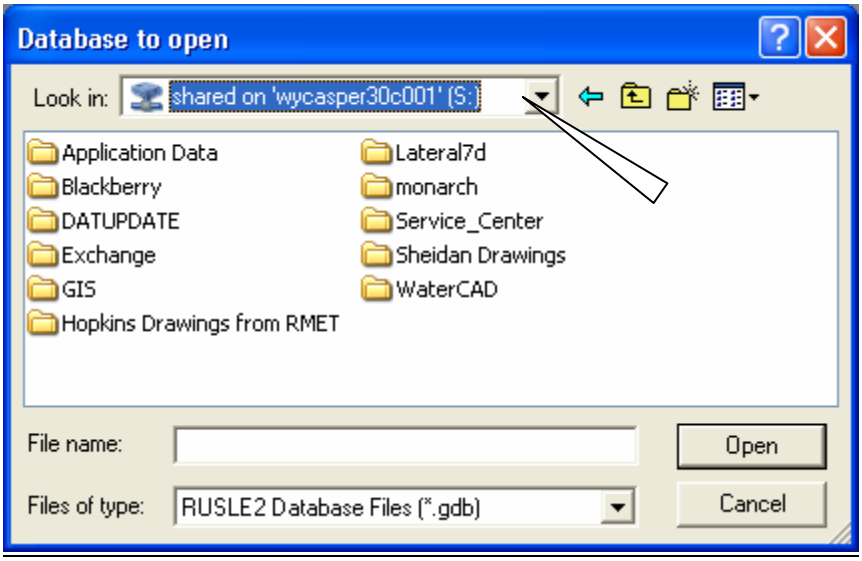
  You may get errors that profiles are missing soils. OK. Change to local climate and soils.

- **#3** The new version RUSLE2 opens under the PLAN view. Simply, close this screen with the x in that screen's top right corner. Select the green slash-profile tab at the top of the screen, the PROFILE. Next time you open RUSLE2 you will get the profile

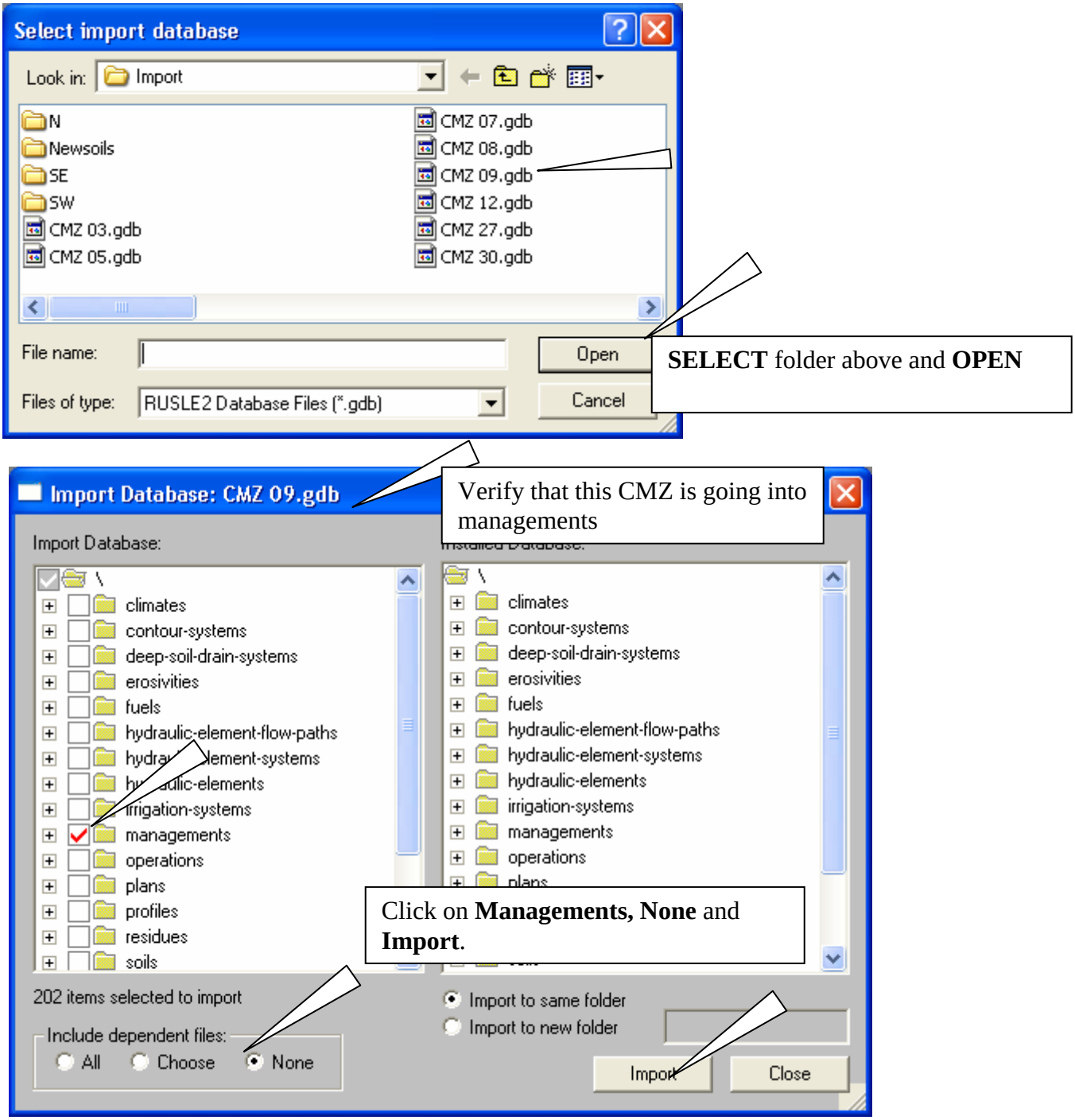
screen and not the plan view. We always working in profile. Change information in the profile folders to local climate and soils.

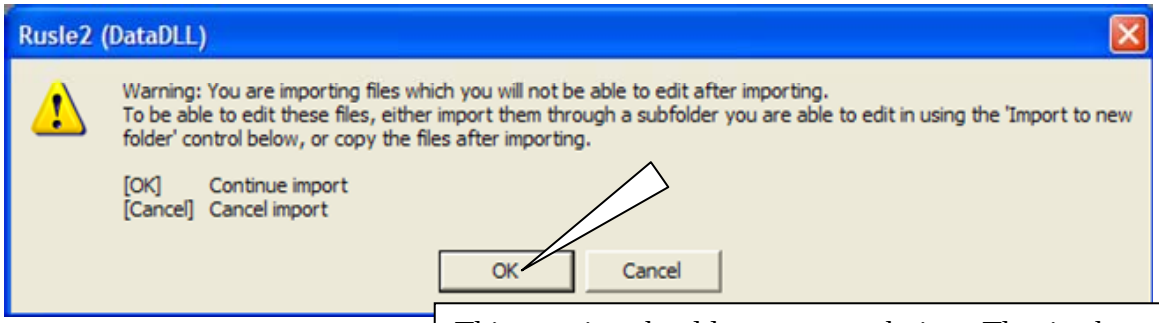
- **#4** If not there, add **WY-ECS-40B.pro.dot** to your C drive/Program Files/ USDA/Rusle2/Printing folder from the S drive/Rusle2 Data folder. This is the NRCS product.



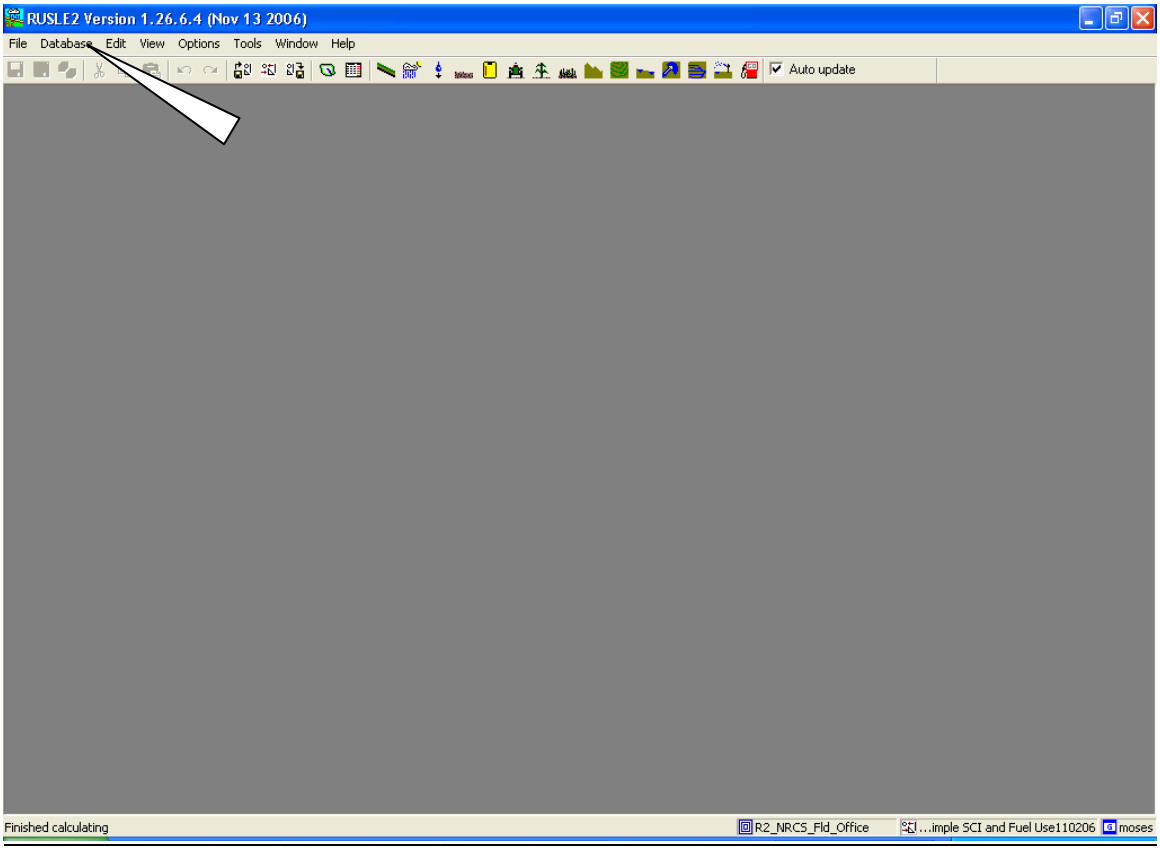


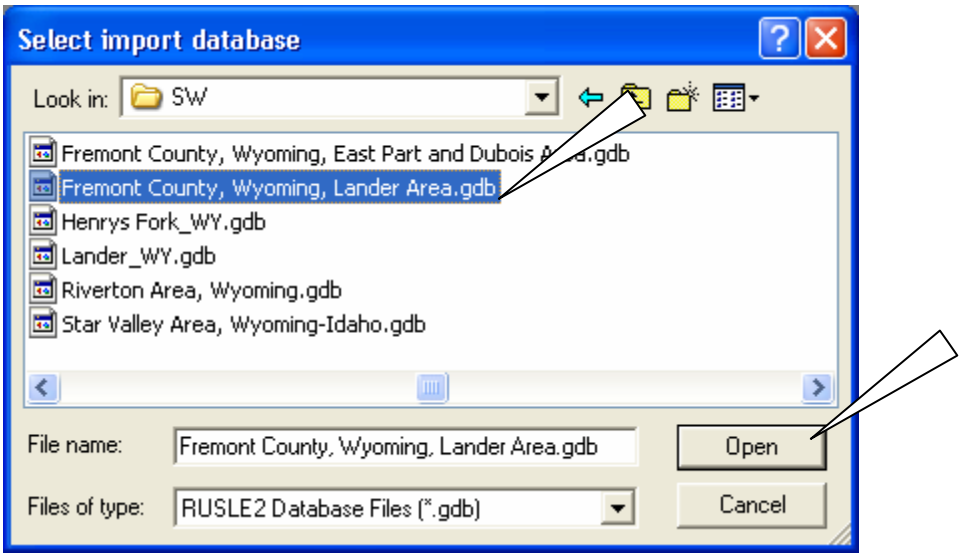
- **#3.** Click on the **Database tab** at the top. Click on the folder and select with **Open**. Select the folder this database will go in by **clicking in the square box** left of the yellow folder. Verify in the title at the top that you are selecting the correct folder for that database! Click **NONE** and **IMPORT**. A warning screen will come up, that's **OK**. The program will run a consistency check and then Import is complete. Click **OK**. Continue with your Database imports until you have cmz 7 and/or cmz 9, climate, and soil survey areas imported.

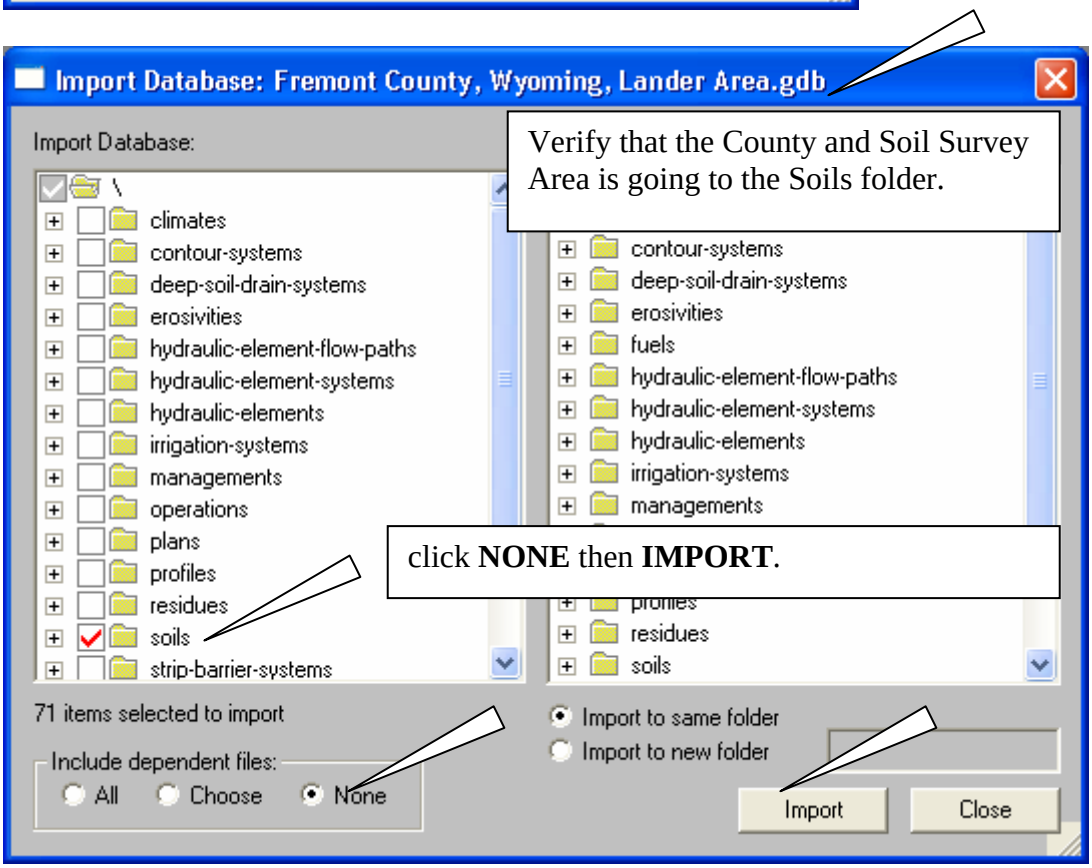


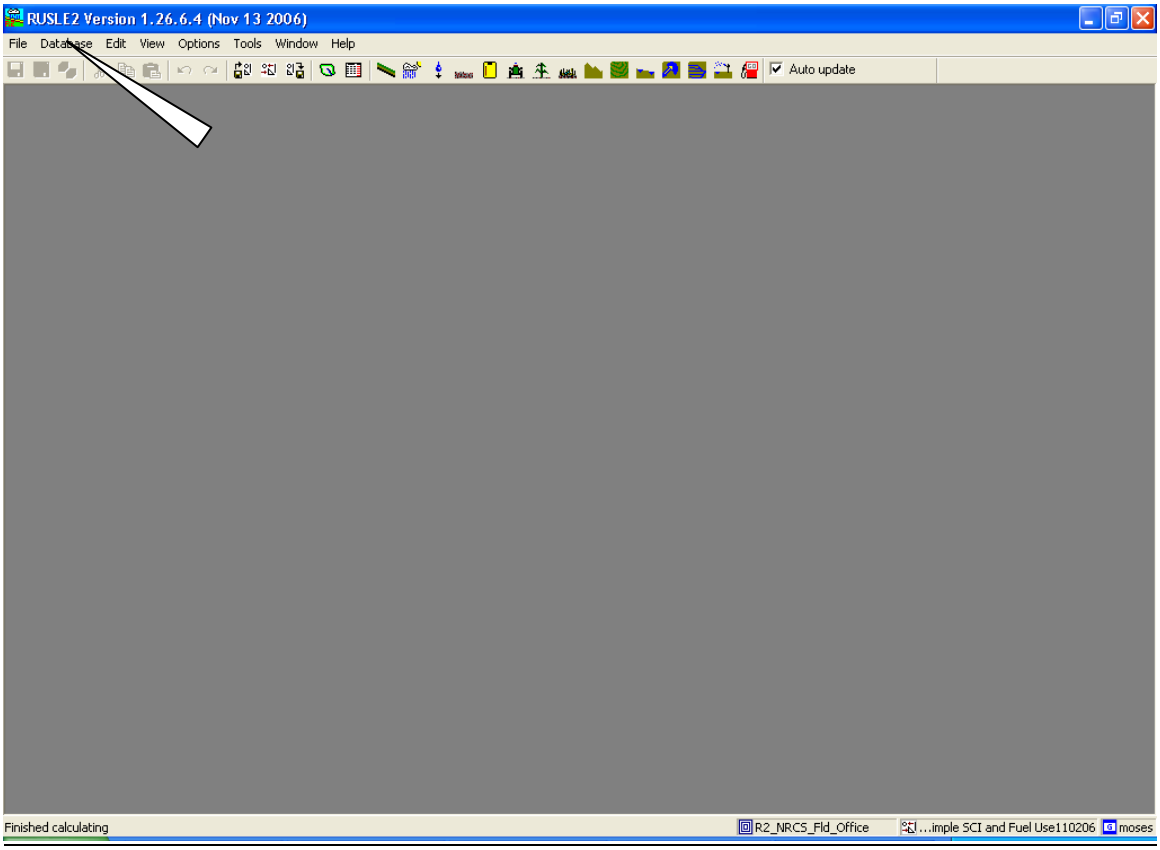


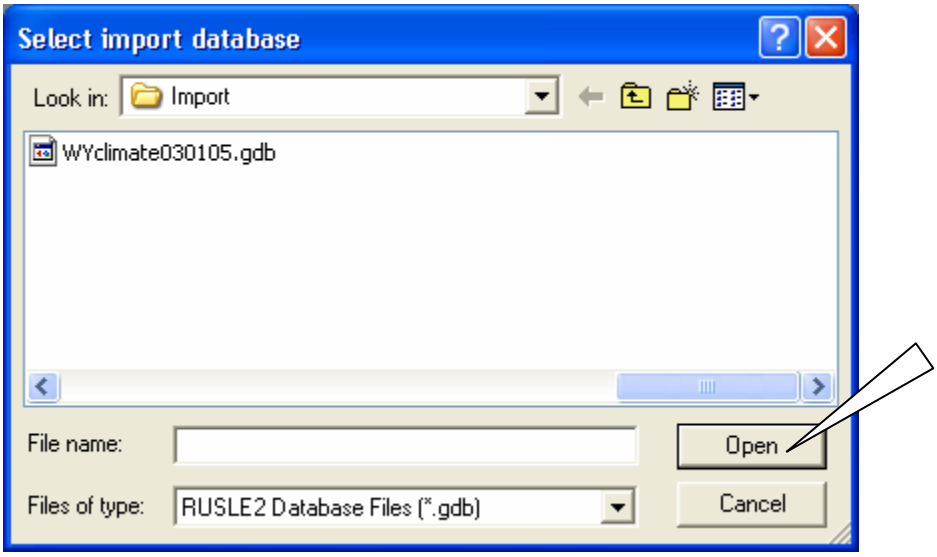
This warning should come up each time. That is okay. Select OK to proceed. A data consistency check will be done and the check's two numbers should be close.

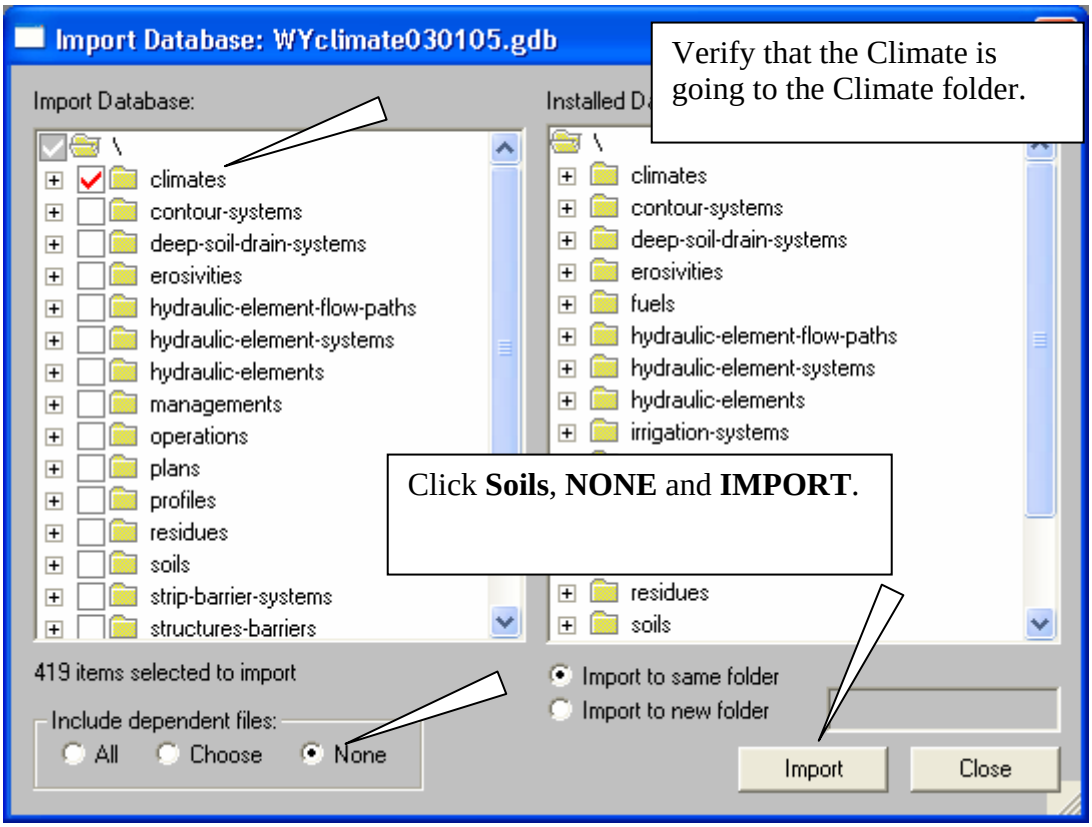



Select import database
Look in: SW
Fremont County, Wyoming, East Part and Dubois Area.gdb
Fremont County, Wyoming, Lander Area.gdb
Henrys Fork_WY.gdb
Lander_WY.gdb
Riverton Area, Wyoming.gdb
Star Valley Area, Wyoming-Idaho.gdb
File name: Fremont County, Wyoming, Lander Area.gdb
Open
Files of type: RUSLE2 Database Files (*.gdb)
Cancel


Import Database: Fremont County, Wyoming, Lander Area.gdb
Verify that the County and Soil Survey Area is going to the Soils folder.
Import Database:
\
climates
contour-systems
deep-soil-drain-systems
erosivities
hydraulic-element-flow-paths
hydraulic-element-systems
hydraulic-elements
irrigation-systems
managements
operations
plans
profiles
residues
soils
strip-barrier-systems
contour-systems
deep-soil-drain-systems
erosivities
fuels
hydraulic-element-flow-paths
hydraulic-element-systems
hydraulic-elements
irrigation-systems
managements
residues
soils
click NONE then IMPORT.
71 items selected to import
Include dependent files:
All
Choose
None
Import to same folder
Import to new folder
Import
Close


RUSLE2 Version 1.26.6.4 (Nov 13 2006)
File Database Edit View Options Tools Window Help
Auto update
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses


Select import database
Look in:
Import
WYclimate030105.gdb
File name:
Open
Files of type:
RUSLE2 Database Files (*.gdb)
Cancel



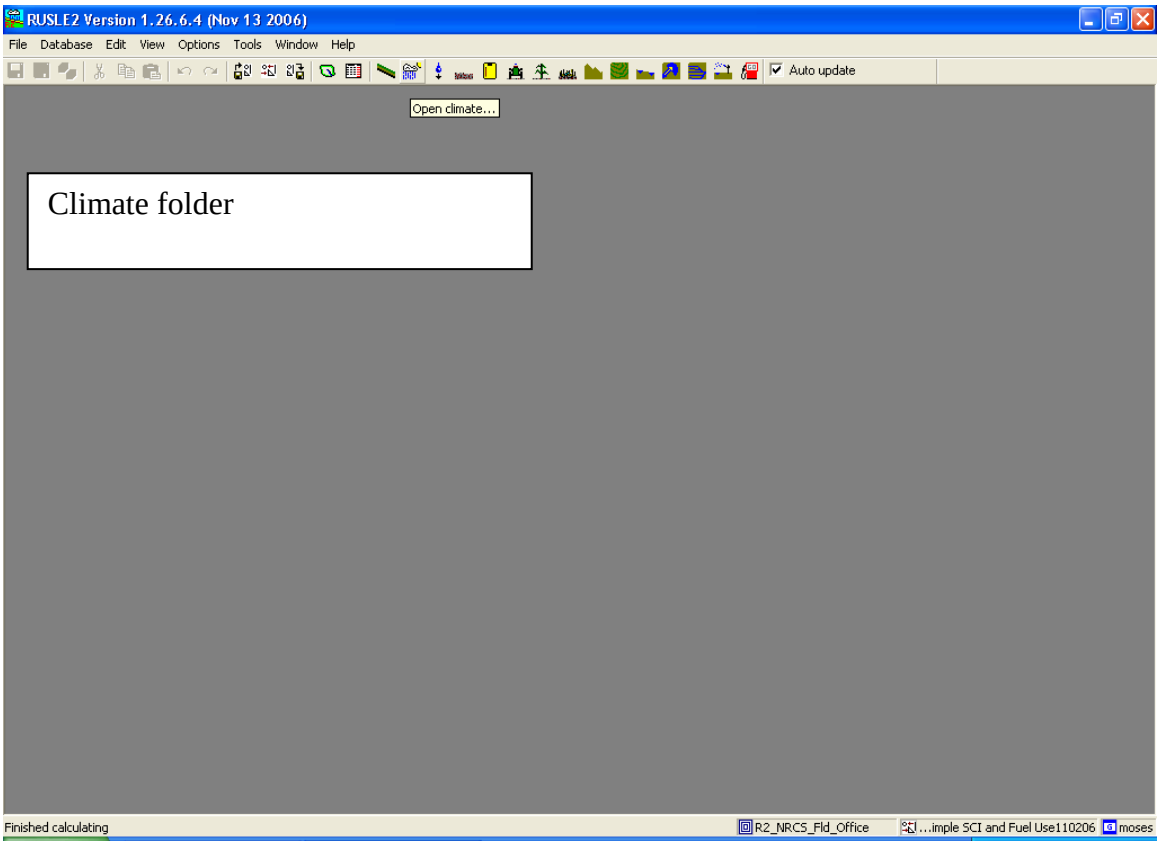
Pages 10 – 17 contain a detailed look into the RUSLE2 operational databases

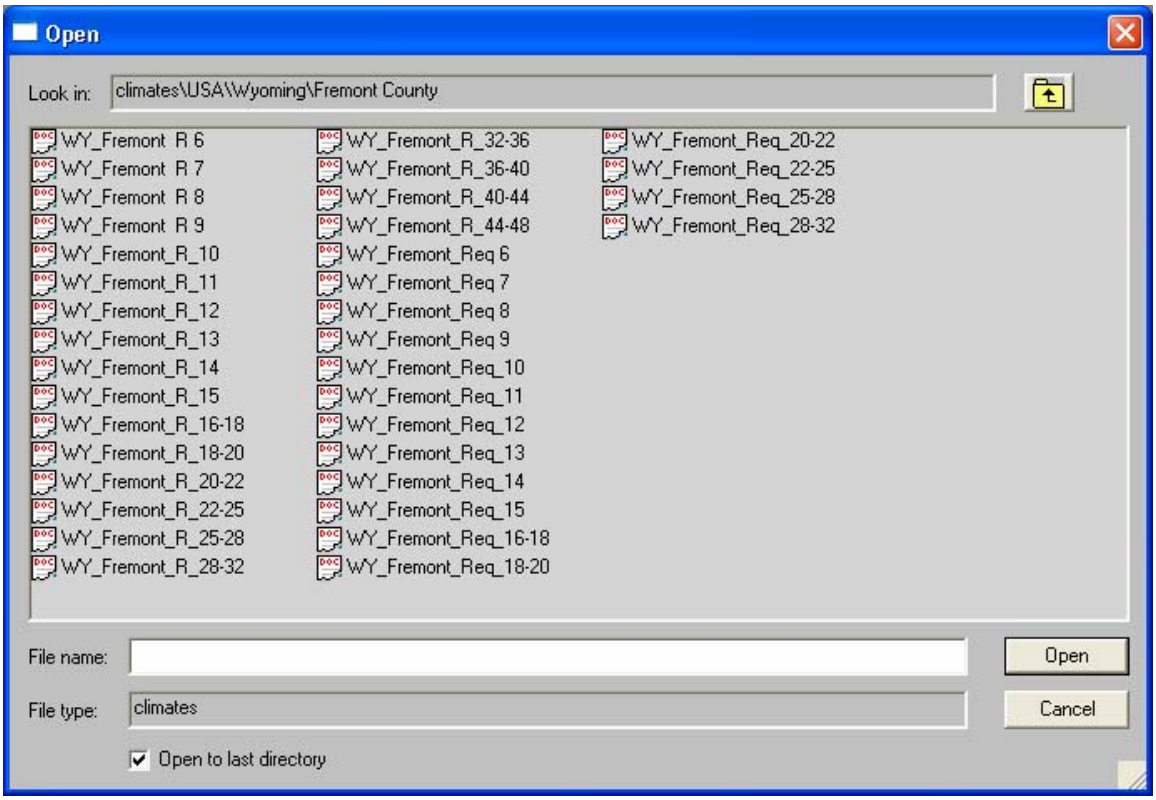
Page 10 Climate database
Page 11 has the location of the precipitation map to be used with RUSLE2

Page 11-12 Soils database
Page 13 generic soils database

Page 14 Crop Management Zone map-- a guide to the closest -- cmz 7 or cmz9
Page 15-17 Crop Management database

To begin using RUSLE2 start with the PROFILE screen on page 18


RUSLE2 Version 1.26.6.4 (Nov 13 2006)
File Database Edit View Options Tools Window Help
Auto update
Open climate...
Climate folder
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses

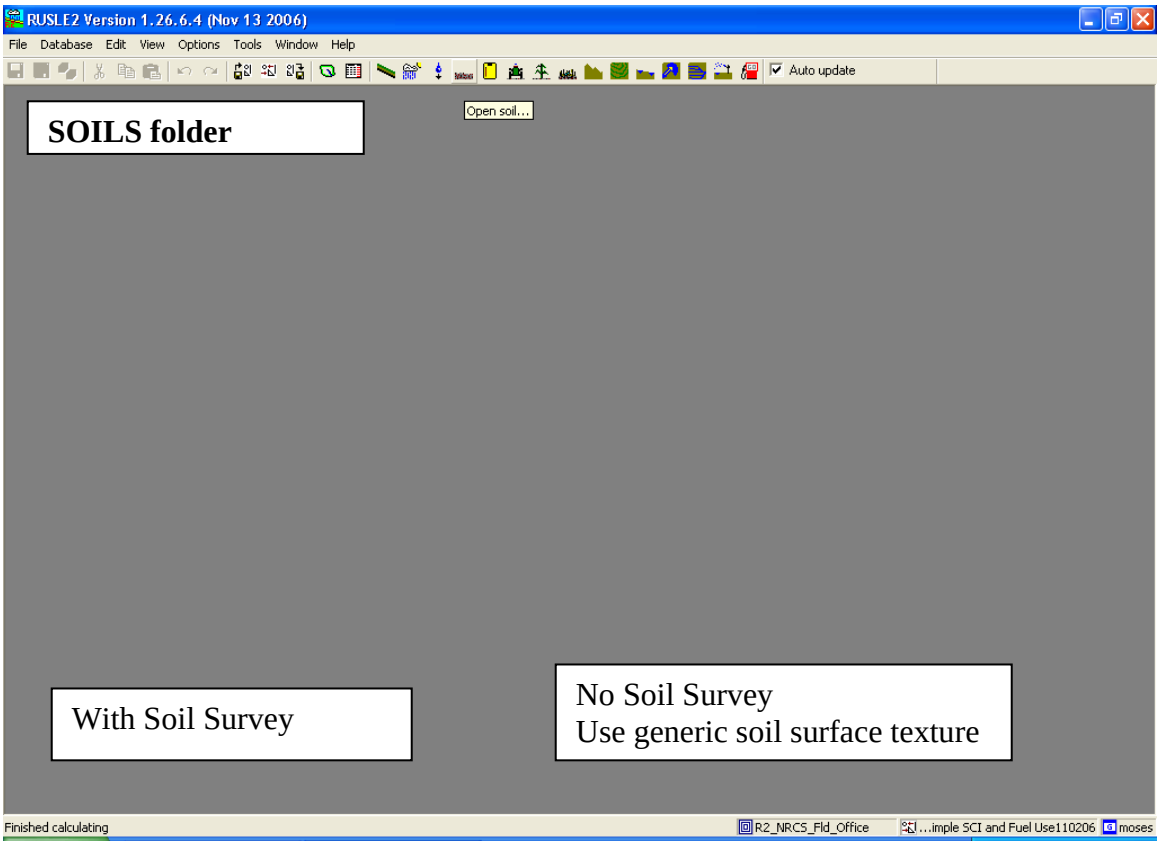

Open
Look in: climates\USA\Wyoming\Fremont County
WY_Fremont R 6
WY_Fremont R 7
WY_Fremont R 8
WY_Fremont R 9
WY_Fremont_R_10
WY_Fremont_R_11
WY_Fremont_R_12
WY_Fremont_R_13
WY_Fremont_R_14
WY_Fremont_R_15
WY_Fremont_R_16-18
WY_Fremont_R_18-20
WY_Fremont_R_20-22
WY_Fremont_R_22-25
WY_Fremont_R_25-28
WY_Fremont_R_28-32
WY_Fremont_R_32-36
WY_Fremont_R_36-40
WY_Fremont_R_40-44
WY_Fremont_R_44-48
WY_Fremont_Req 6
WY_Fremont_Req 7
WY_Fremont_Req 8
WY_Fremont_Req 9
WY_Fremont_Req_10
WY_Fremont_Req_11
WY_Fremont_Req_12
WY_Fremont_Req_13
WY_Fremont_Req_14
WY_Fremont_Req_15
WY_Fremont_Req_16-18
WY_Fremont_Req_18-20
WY_Fremont_Req_20-22
WY_Fremont_Req_22-25
WY_Fremont_Req_25-28
WY_Fremont_Req_28-32
File name:
File type: climates
Open
Cancel
Open to last directory

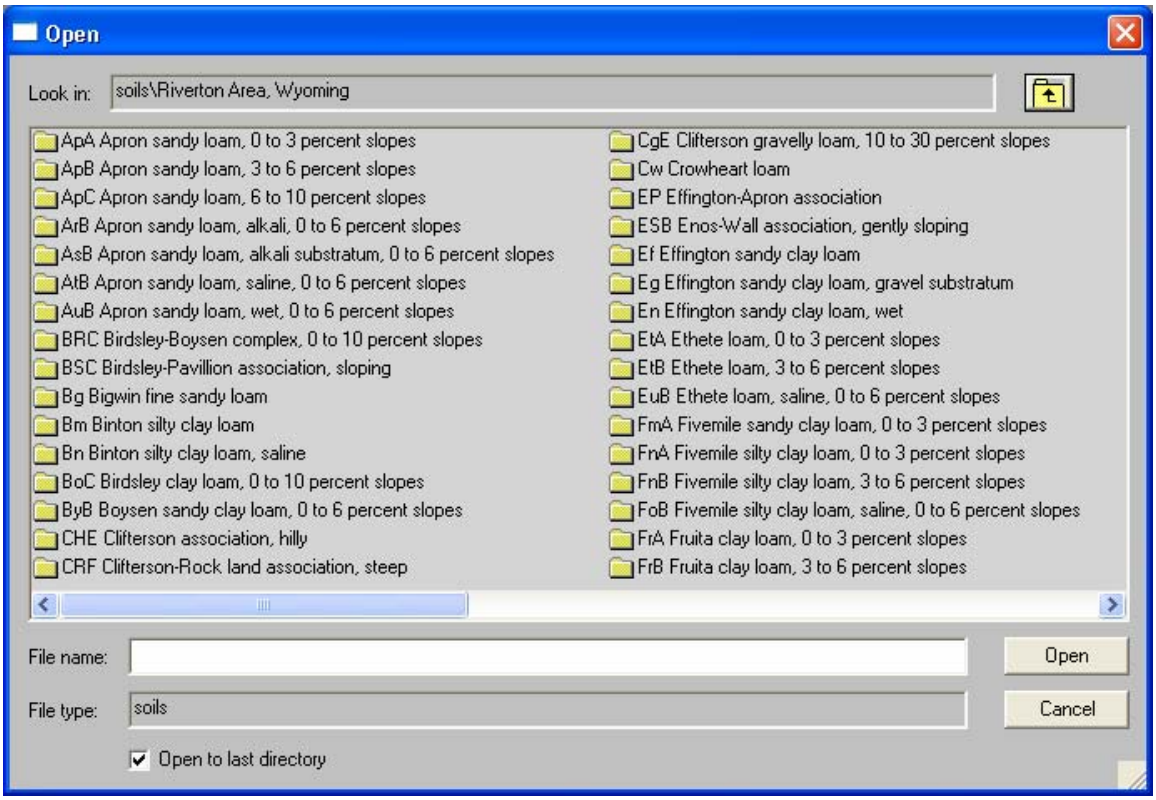
RAINFALL-RUNOFF EROSIVITY FACTOR (R) The numerical values used for R quantifies the effect of raindrop impact and also reflects the amount and rate of runoff associated with the rain. The erosion index (R) was developed to address intensity of rainfall events. Additionally, a separate procedure for evaluating R for locations where there are significant forces causing runoff from snowmelt, rain on frozen soil, or irrigation was incorporated. For locations where this type of erosion is significant, a **Req value** is used for cropland and rangeland.

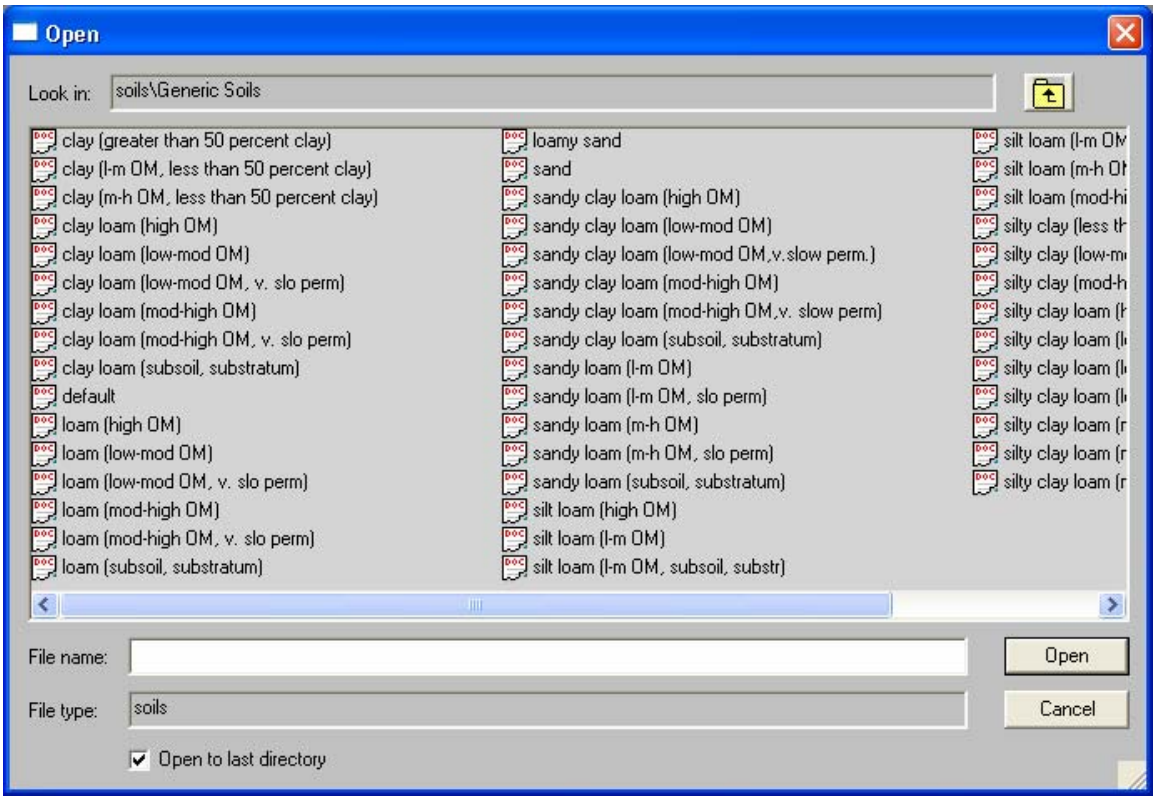
Select your area of work from the RUSLE2 climate maps and print them in color. RUSLE2 climate has two selections. R is for water erosion from rainfall precipitation and Req (Rainfall equivalent) is water erosion from melting snow. You need to consider the location of your site and select the **appropriate R or Req**: average precipitation (7.5") map or a number from the Precipitation Range (10-11") map.

RUSLE2 WY Climate Maps:
http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=WY

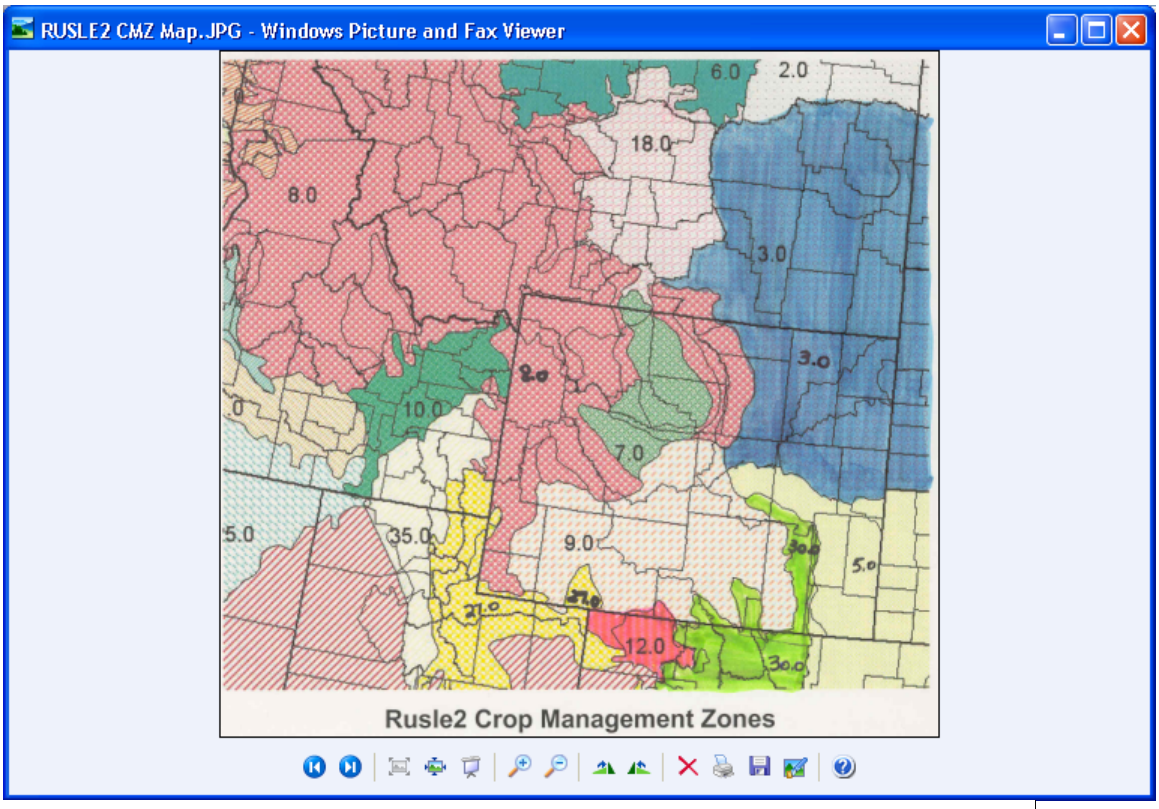
eFOTG/Section I/Erosion Prediction/Water Erosion/RUSLE2 Precip Maps/ Average Precip Map (7.5")
eFOTG/Sec I/Erosion Prediction/Water Erosion/RUSLE2 Precip Maps/Precipitation Ranges Map (10-11")

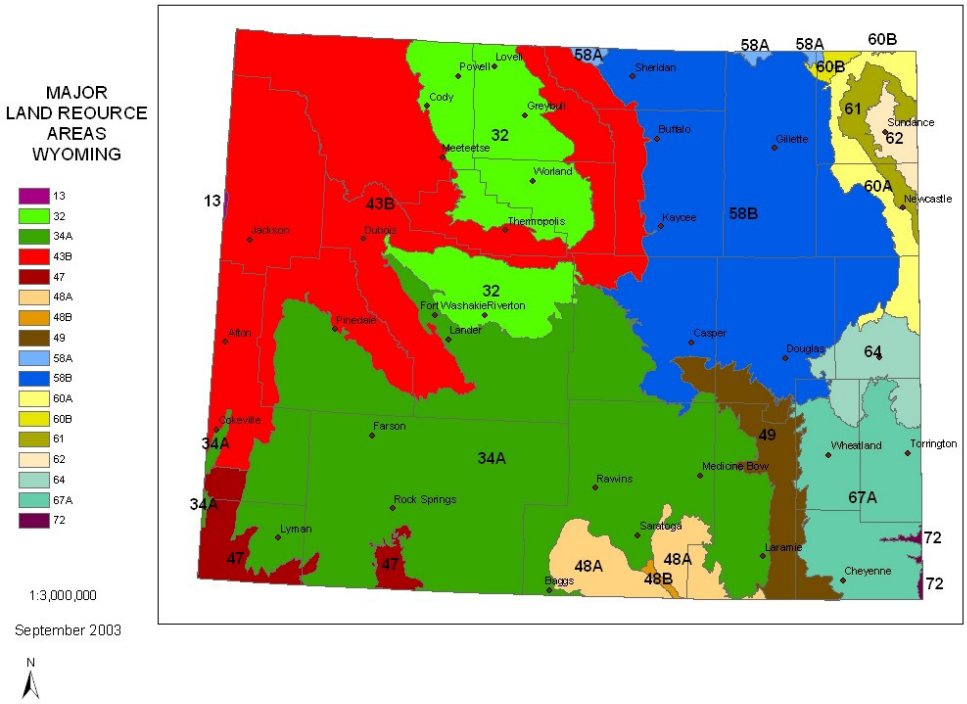

RUSLE2 Version 1.26.6.4 (Nov 13 2006)
File Database Edit View Options Tools Window Help
Auto update
Open soil...
SOILS folder
With Soil Survey
No Soil Survey
Use generic soil surface texture
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses

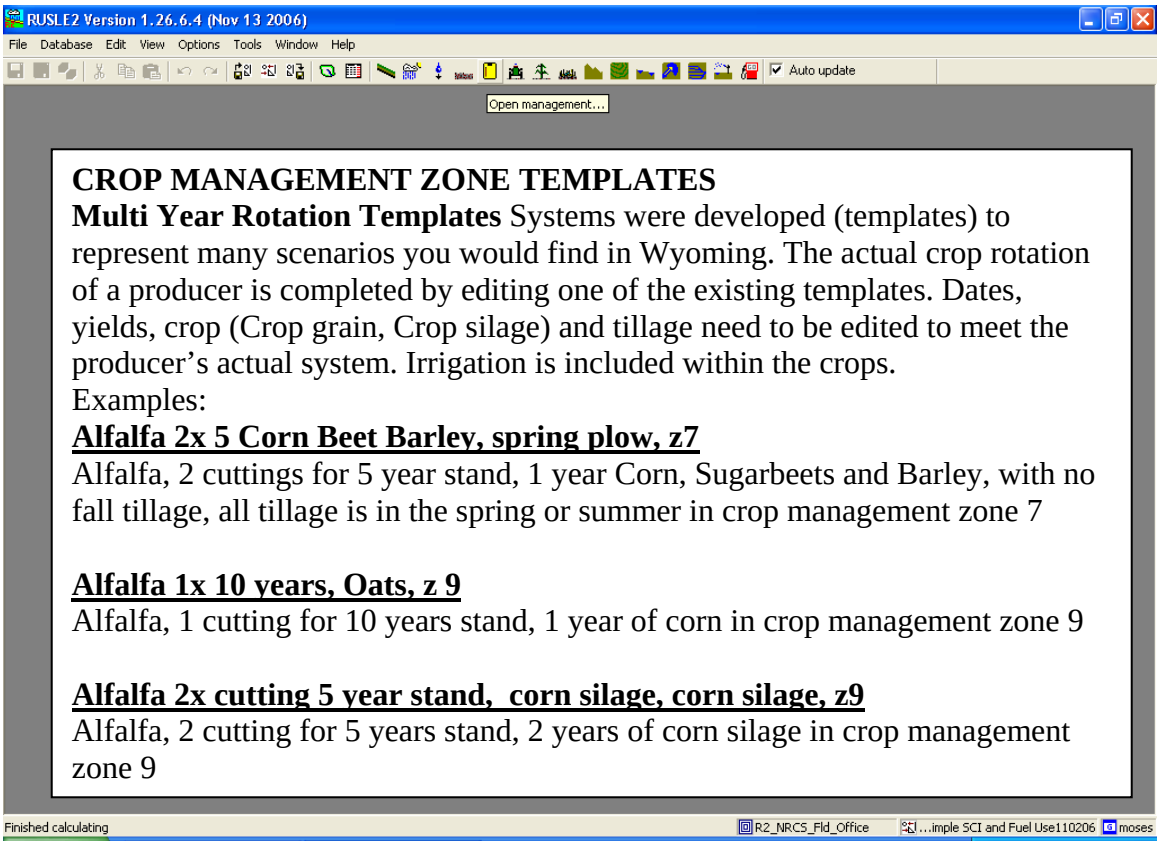

Open
Look in: soils\Riverton Area, Wyoming
ApA Apron sandy loam, 0 to 3 percent slopes
ApB Apron sandy loam, 3 to 6 percent slopes
ApC Apron sandy loam, 6 to 10 percent slopes
ArB Apron sandy loam, alkali, 0 to 6 percent slopes
AsB Apron sandy loam, alkali substratum, 0 to 6 percent slopes
AtB Apron sandy loam, saline, 0 to 6 percent slopes
AuB Apron sandy loam, wet, 0 to 6 percent slopes
BRC Birdsley-Boysen complex, 0 to 10 percent slopes
BSC Birdsley-Pavillion association, sloping
Bg Bigwin fine sandy loam
Bm Binton silty clay loam
Bn Binton silty clay loam, saline
BoC Birdsley clay loam, 0 to 10 percent slopes
ByB Boysen sandy clay loam, 0 to 6 percent slopes
CHE Clifterson association, hilly
CRF Clifterson-Rock land association, steep
CgE Clifterson gravelly loam, 10 to 30 percent slopes
Cw Crowheart loam
EP Effington-Apron association
ESB Enos-Wall association, gently sloping
Ef Effington sandy clay loam
Eg Effington sandy clay loam, gravel substratum
En Effington sandy clay loam, wet
EtA Ethete loam, 0 to 3 percent slopes
EtB Ethete loam, 3 to 6 percent slopes
EuB Ethete loam, saline, 0 to 6 percent slopes
FmA Fivemile sandy clay loam, 0 to 3 percent slopes
FnA Fivemile silty clay loam, 0 to 3 percent slopes
FnB Fivemile silty clay loam, 3 to 6 percent slopes
FoB Fivemile silty clay loam, saline, 0 to 6 percent slopes
FrA Fruita clay loam, 0 to 3 percent slopes
FrB Fruita clay loam, 3 to 6 percent slopes
File name:
File type: soils
Open
Cancel
Open to last directory


Open
Look in:
soils\Generic Soils
clay (greater than 50 percent clay)
clay (l-m OM, less than 50 percent clay)
clay (m-h OM, less than 50 percent clay)
clay loam (high OM)
clay loam (low-mod OM)
clay loam (low-mod OM, v. slo perm)
clay loam (mod-high OM)
clay loam (mod-high OM, v. slo perm)
clay loam (subsoil, substratum)
default
loam (high OM)
loam (low-mod OM)
loam (low-mod OM, v. slo perm)
loam (mod-high OM)
loam (mod-high OM, v. slo perm)
loam (subsoil, substratum)
loamy sand
sand
sandy clay loam (high OM)
sandy clay loam (low-mod OM)
sandy clay loam (low-mod OM,v.slow perm.)
sandy clay loam (mod-high OM)
sandy clay loam (mod-high OM,v. slow perm)
sandy clay loam (subsoil, substratum)
sandy loam (l-m OM)
sandy loam (l-m OM, slo perm)
sandy loam (m-h OM)
sandy loam (m-h OM, slo perm)
sandy loam (subsoil, substratum)
silt loam (high OM)
silt loam (l-m OM)
silt loam (l-m OM, subsoil, substr)
File name:
File type:
soils
Open
Cancel
Open to last directory

I recommend using CMZ 7 or CMZ 9 for all Wyoming profiles. However, you may choose to use crop management zones aligned with other states. The data in CMZ 7 is the same as CMZ 9.







CROP MANAGEMENT ZONE TEMPLATES

Multi Year Rotation Templates Systems were developed (templates) to represent many scenarios you would find in Wyoming. The actual crop rotation of a producer is completed by editing one of the existing templates. Dates, yields, crop (Crop grain, Crop silage) and tillage need to be edited to meet the producer's actual system. Irrigation is included within the crops.

Examples:

Alfalfa 2x 5 Corn Beet Barley, spring plow, z7

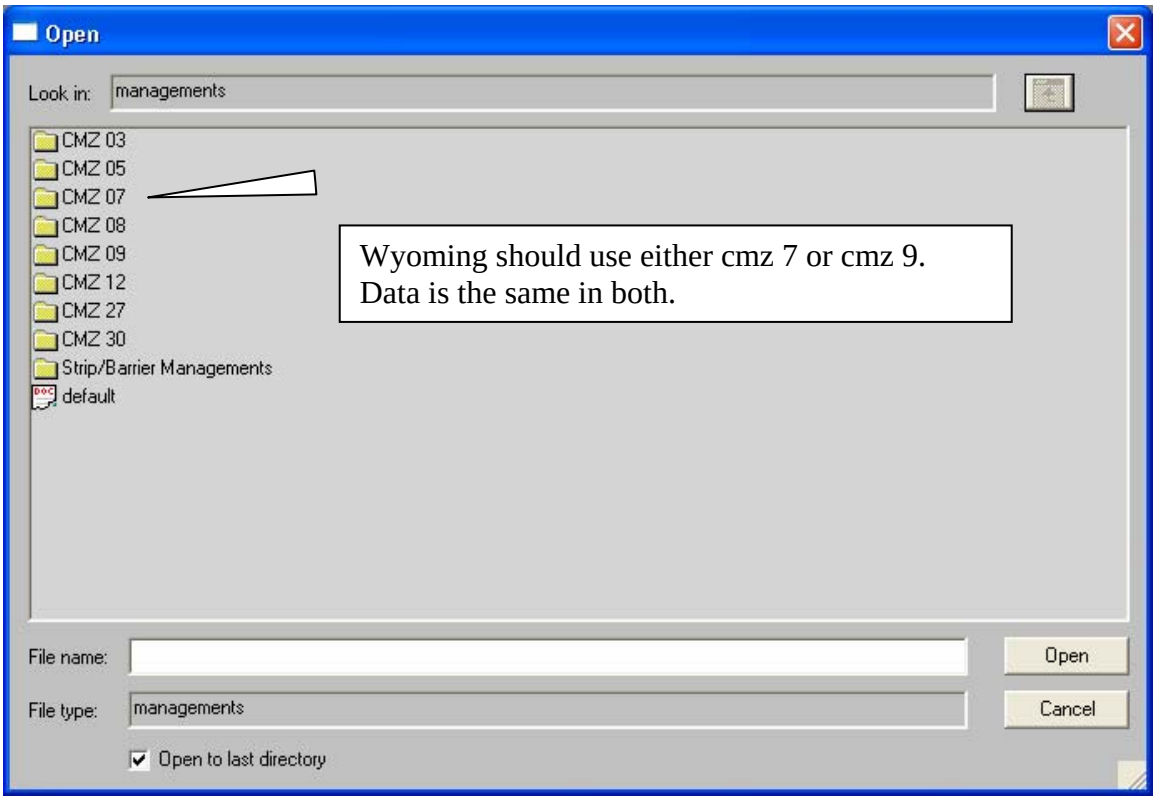
Alfalfa, 2 cuttings for 5 year stand, 1 year Corn, Sugarbeets and Barley, with no fall tillage, all tillage is in the spring or summer in crop management zone 7

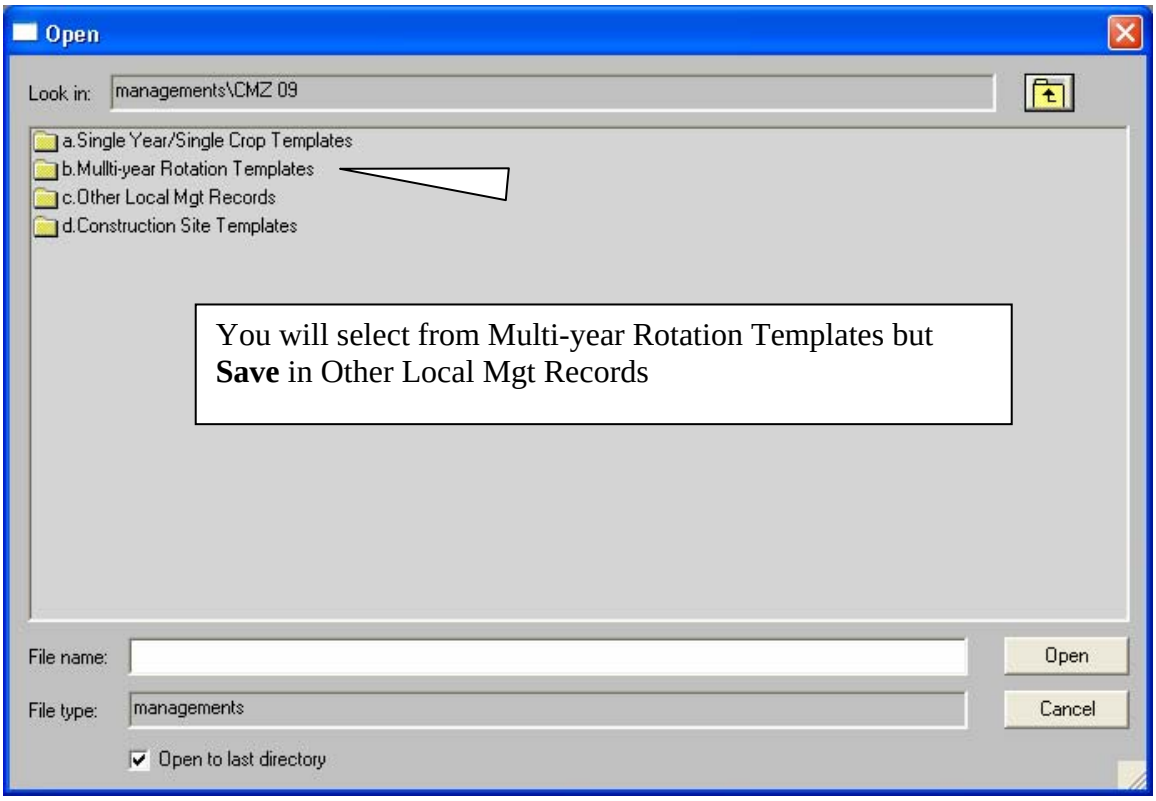
Alfalfa 1x 10 years, Oats, z 9

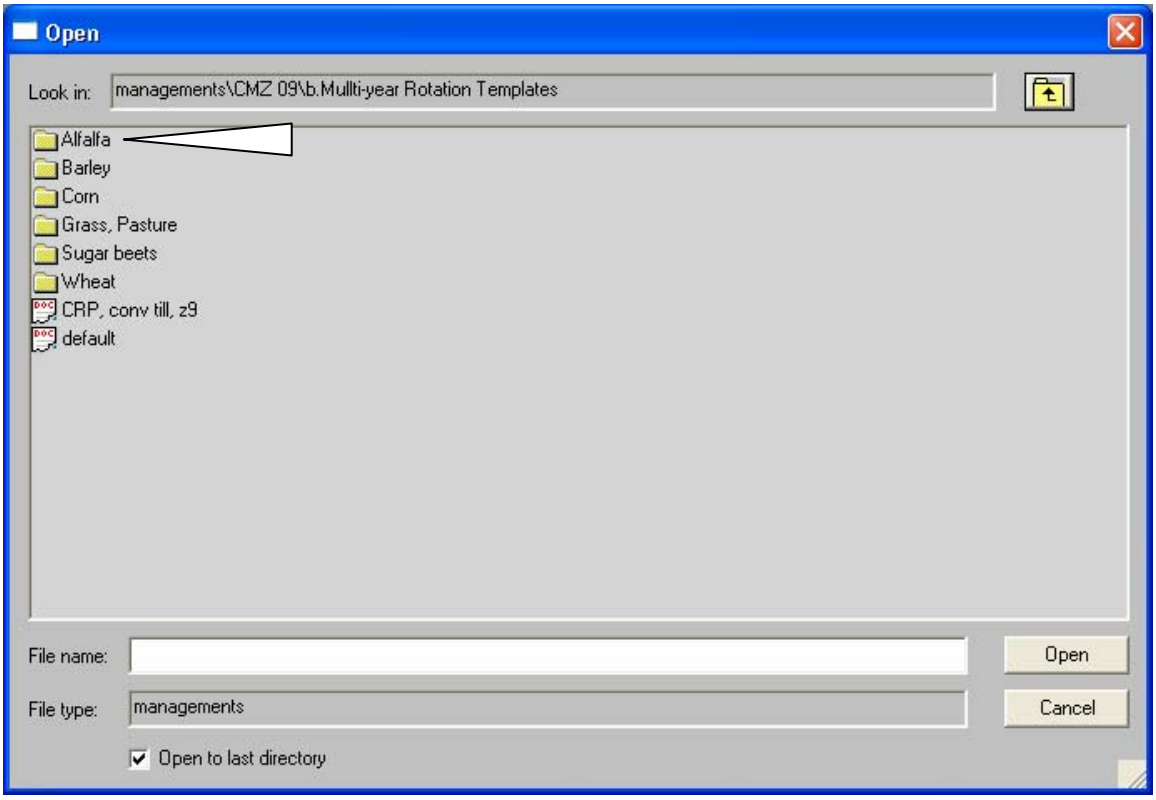
Alfalfa, 1 cutting for 10 years stand, 1 year of corn in crop management zone 9

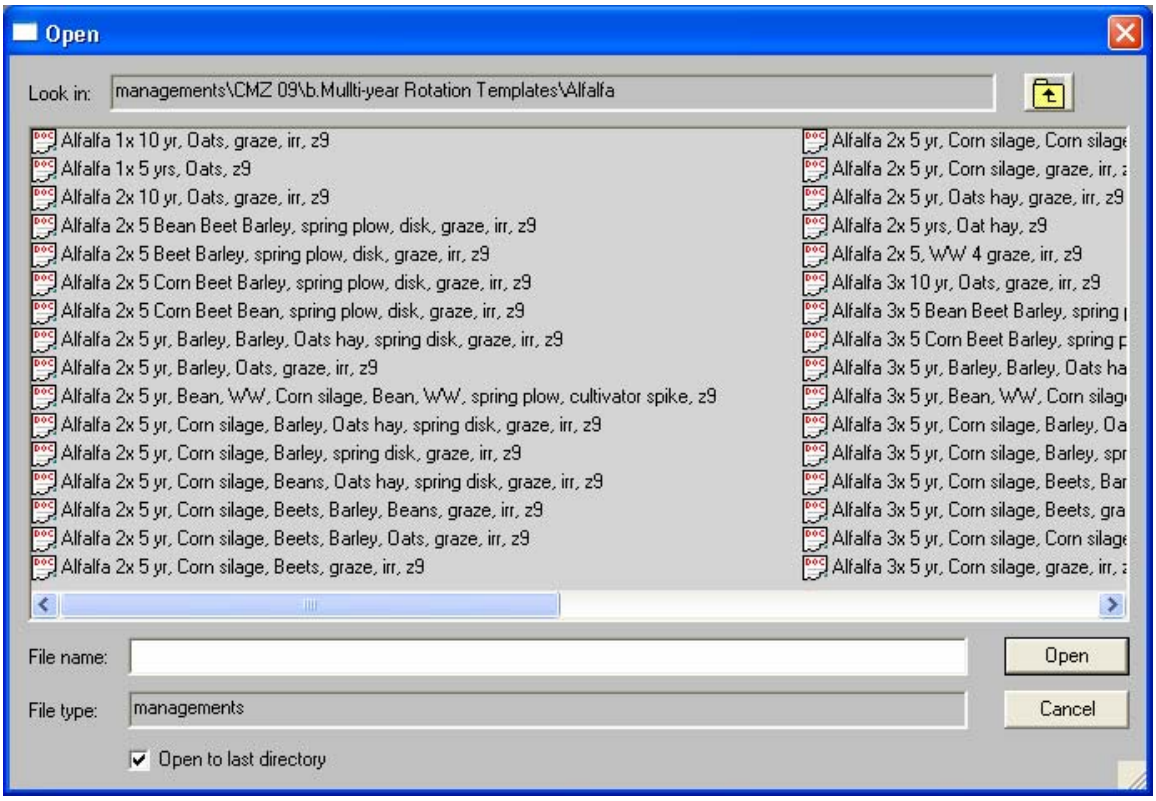
Alfalfa 2x cutting 5 year stand, corn silage, corn silage, z9

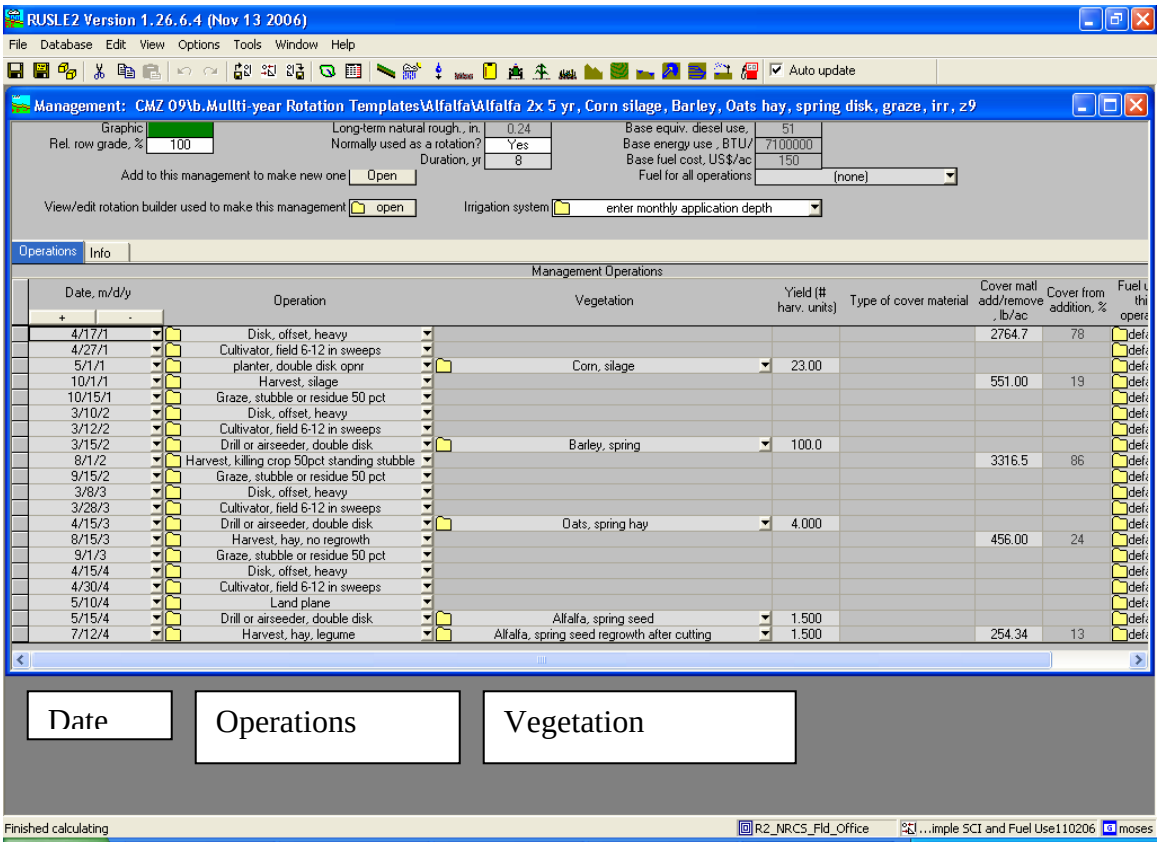
Alfalfa, 2 cutting for 5 years stand, 2 years of corn silage in crop management zone 9

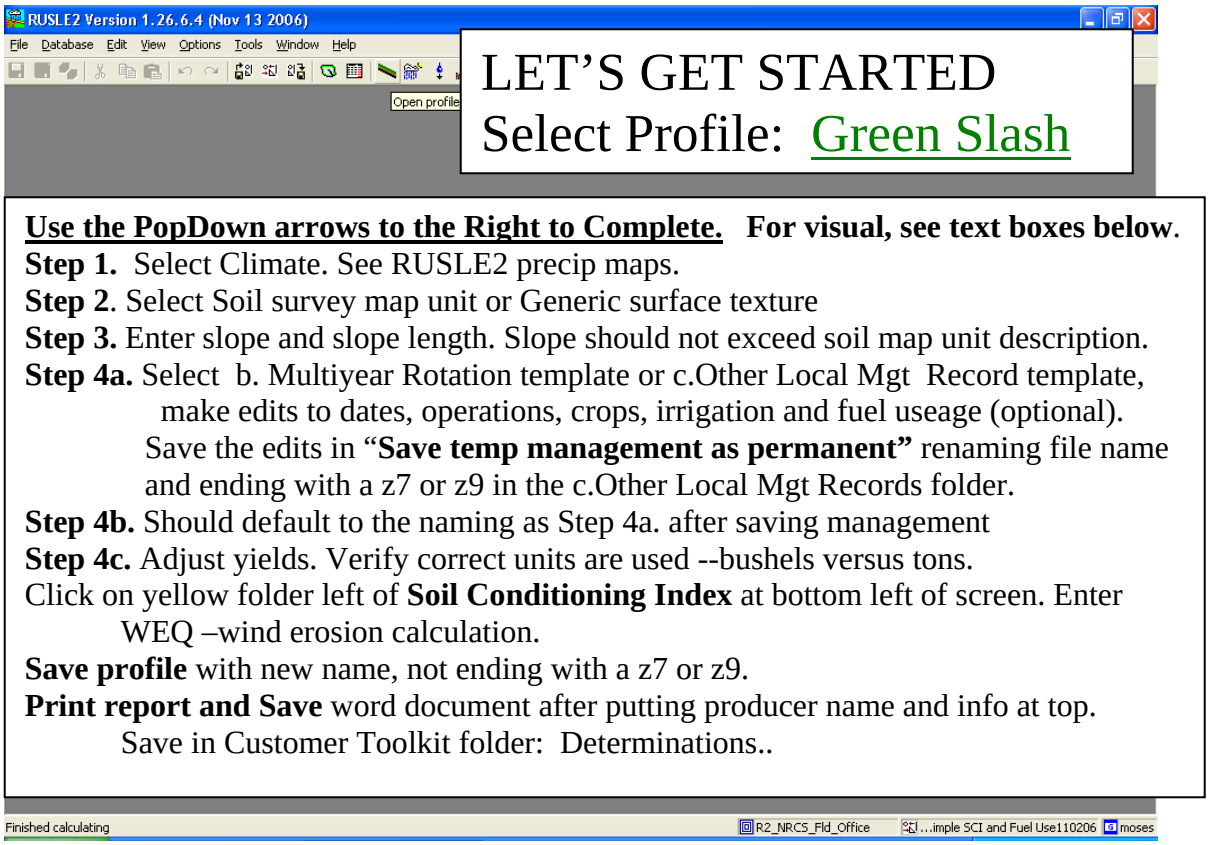



Open
Look in:
managements\CMZ 09
a.Single Year/Single Crop Templates
b.Mullti-year Rotation Templates
c.Other Local Mgt Records
d.Construction Site Templates
You will select from Multi-year Rotation Templates but **Save** in Other Local Mgt Records
File name:
Open
File type:
managements
Cancel
Open to last directory


Open
Look in:
managements\CMZ 09\b.Mullti-year Rotation Templates
Alfalfa
Barley
Corn
Grass, Pasture
Sugar beets
Wheat
CRP, conv till, z9
default
File name:
Open
File type:
managements
Cancel
Open to last directory


Open
Look in: managements\CMZ 09\b.Mullti-year Rotation Templates\Alfalfa
Alfalfa 1x 10 yr, Oats, graze, irr, z9
Alfalfa 1x 5 yrs, Oats, z9
Alfalfa 2x 10 yr, Oats, graze, irr, z9
Alfalfa 2x 5 Bean Beet Barley, spring plow, disk, graze, irr, z9
Alfalfa 2x 5 Beet Barley, spring plow, disk, graze, irr, z9
Alfalfa 2x 5 Corn Beet Barley, spring plow, disk, graze, irr, z9
Alfalfa 2x 5 Corn Beet Bean, spring plow, disk, graze, irr, z9
Alfalfa 2x 5 yr, Barley, Barley, Oats hay, spring disk, graze, irr, z9
Alfalfa 2x 5 yr, Barley, Oats, graze, irr, z9
Alfalfa 2x 5 yr, Bean, WW, Corn silage, Bean, WW, spring plow, cultivator spike, z9
Alfalfa 2x 5 yr, Corn silage, Barley, Oats hay, spring disk, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Barley, spring disk, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Beans, Oats hay, spring disk, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Beans, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Oats, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Beets, graze, irr, z9
Alfalfa 2x 5 yr, Corn silage, Corn silage
Alfalfa 2x 5 yr, Corn silage, graze, irr,
Alfalfa 2x 5 yr, Oats hay, graze, irr, z9
Alfalfa 2x 5 yrs, Oat hay, z9
Alfalfa 2x 5, WW 4 graze, irr, z9
Alfalfa 3x 10 yr, Oats, graze, irr, z9
Alfalfa 3x 5 Bean Beet Barley, spring
Alfalfa 3x 5 Corn Beet Barley, spring
Alfalfa 3x 5 yr, Barley, Barley, Oats ha
Alfalfa 3x 5 yr, Bean, WW, Corn silag
Alfalfa 3x 5 yr, Corn silage, Barley, Oa
Alfalfa 3x 5 yr, Corn silage, Barley, spr
Alfalfa 3x 5 yr, Corn silage, Beets, Bar
Alfalfa 3x 5 yr, Corn silage, Beets, gra
Alfalfa 3x 5 yr, Corn silage, Corn silage
Alfalfa 3x 5 yr, Corn silage, graze, irr,
File name:
File type: managements
Open
Cancel
Open to last directory


RUSLE2 Version 1.26.6.4 (Nov 13 2006)
File Database Edit View Options Tools Window Help
Auto update
Management: CMZ 09\b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 yr, Corn silage, Barley, Oats hay, spring disk, graze, irr, z9
Graphic
Rel. row grade, % 100
Long-term natural rough., in. 0.24
Normally used as a rotation? Yes
Duration, yr 8
Base equiv. diesel use, 51
Base energy use , BTU/ 7100000
Base fuel cost, US$/ac 150
Fuel for all operations (none)
Add to this management to make new one Open
View/edit rotation builder used to make this management open
Irrigation system enter monthly application depth
Operations Info
Management Operations
Date, m/d/y
Operation
Vegetation
Yield (# harv. units)
Type of cover material
Cover matl add/remove , lb/ac
Cover from addition, %
4/17/1 Disk, offset, heavy 2764.7 78
4/27/1 Cultivator, field 6-12 in sweeps
5/1/1 planter, double disk opnr Corn, silage 23.00
10/1/1 Harvest, silage 551.00 19
10/15/1 Graze, stubble or residue 50 pct
3/10/2 Disk, offset, heavy
3/12/2 Cultivator, field 6-12 in sweeps
3/15/2 Drill or airseeder, double disk Barley, spring 100.0
8/1/2 Harvest, killing crop 50pct standing stubble 3316.5 86
9/15/2 Graze, stubble or residue 50 pct
3/8/3 Disk, offset, heavy
3/28/3 Cultivator, field 6-12 in sweeps
4/15/3 Drill or airseeder, double disk Oats, spring hay 4.000
8/15/3 Harvest, hay, no regrowth 456.00 24
9/1/3 Graze, stubble or residue 50 pct
4/15/4 Disk, offset, heavy
4/30/4 Cultivator, field 6-12 in sweeps
5/10/4 Land plane
5/15/4 Drill or airseeder, double disk Alfalfa, spring seed 1.500
7/12/4 Harvest, hay, legume Alfalfa, spring seed regrowth after cutting 1.500 254.34 13
Date
Operations
Vegetation
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses



LET'S GET STARTED
Select Profile: Green Slash

<u>Use the PopDown arrows to the Right to Complete.</u> **For visual, see text boxes below**.

Step 1. Select Climate. See RUSLE2 precip maps.

Step 2. Select Soil survey map unit or Generic surface texture

Step 3. Enter slope and slope length. Slope should not exceed soil map unit description.

Step 4a. Select b. Multiyear Rotation template or c.Other Local Mgt Record template, make edits to dates, operations, crops, irrigation and fuel useage (optional). Save the edits in "**Save temp management as permanent"** renaming file name and ending with a z7 or z9 in the c.Other Local Mgt Records folder.

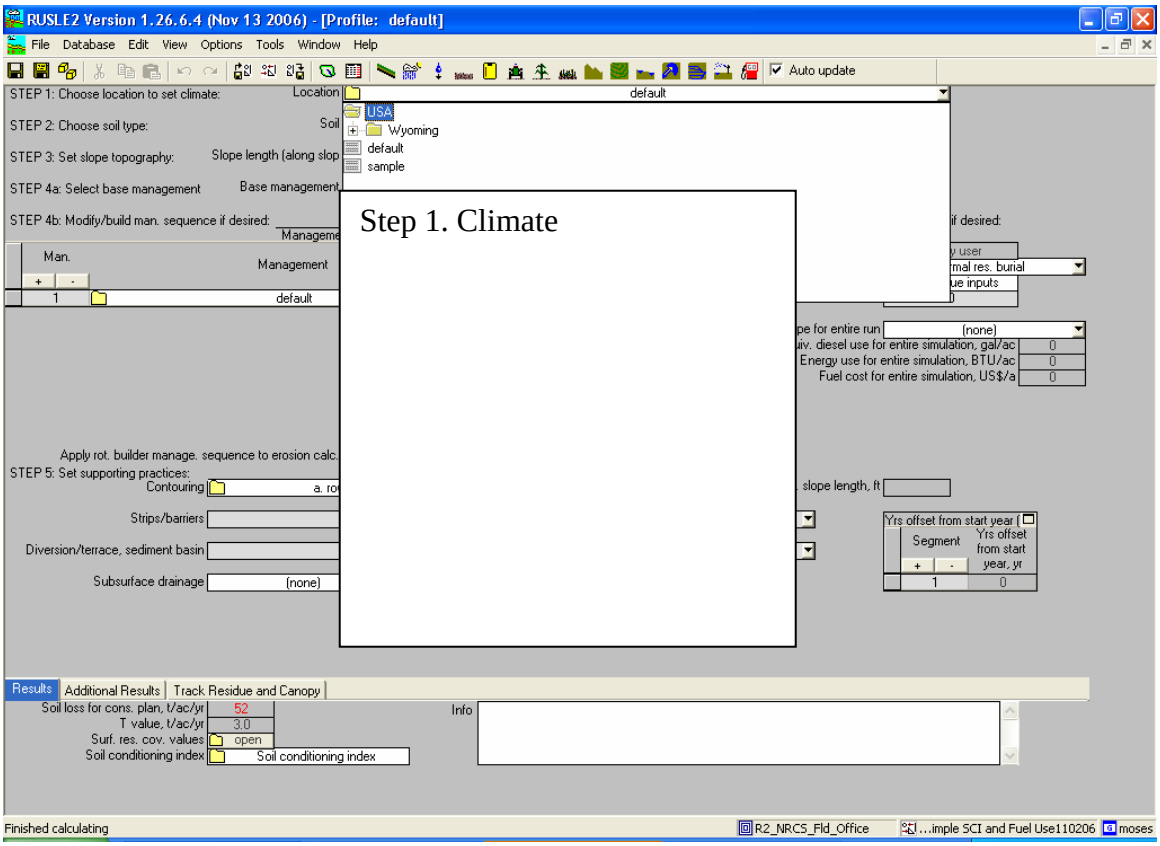
Step 4b. Should default to the naming as Step 4a. after saving management

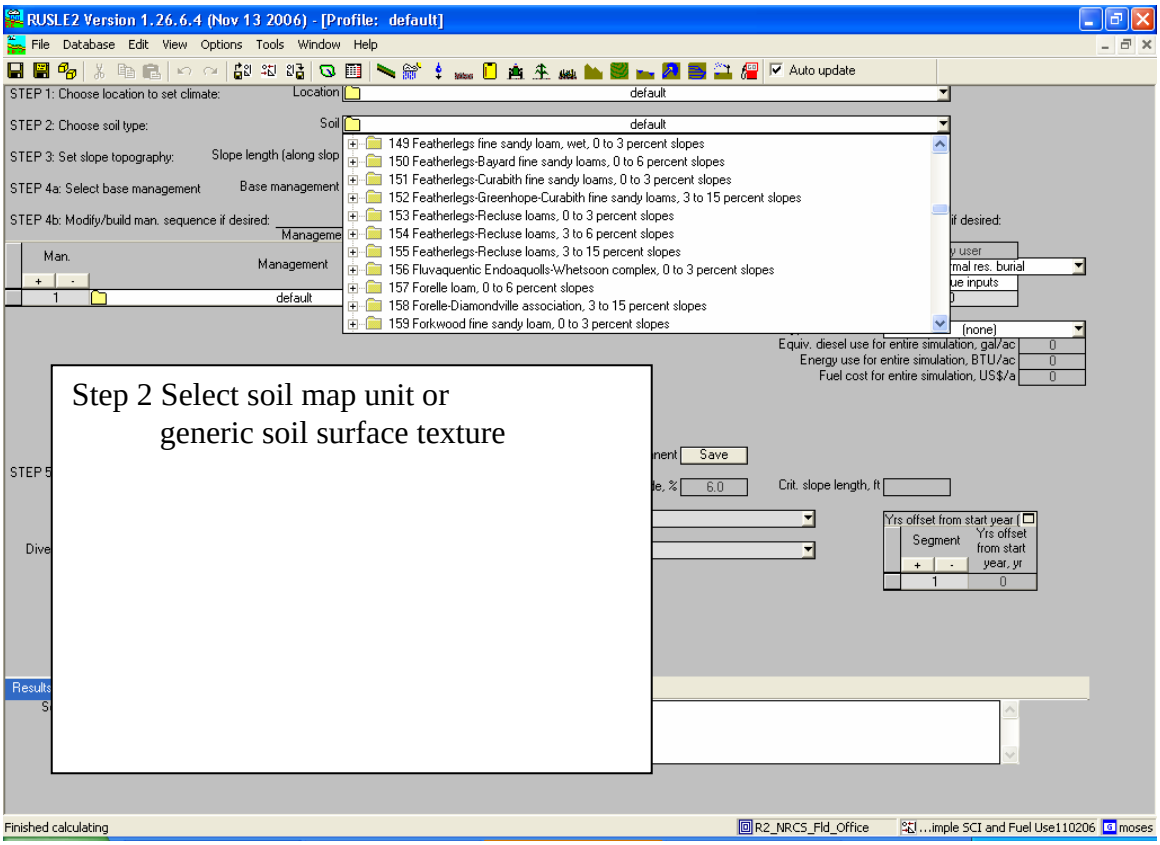
Step 4c. Adjust yields. Verify correct units are used --bushels versus tons.

Click on yellow folder left of **Soil Conditioning Index** at bottom left of screen. Enter WEQ –wind erosion calculation.

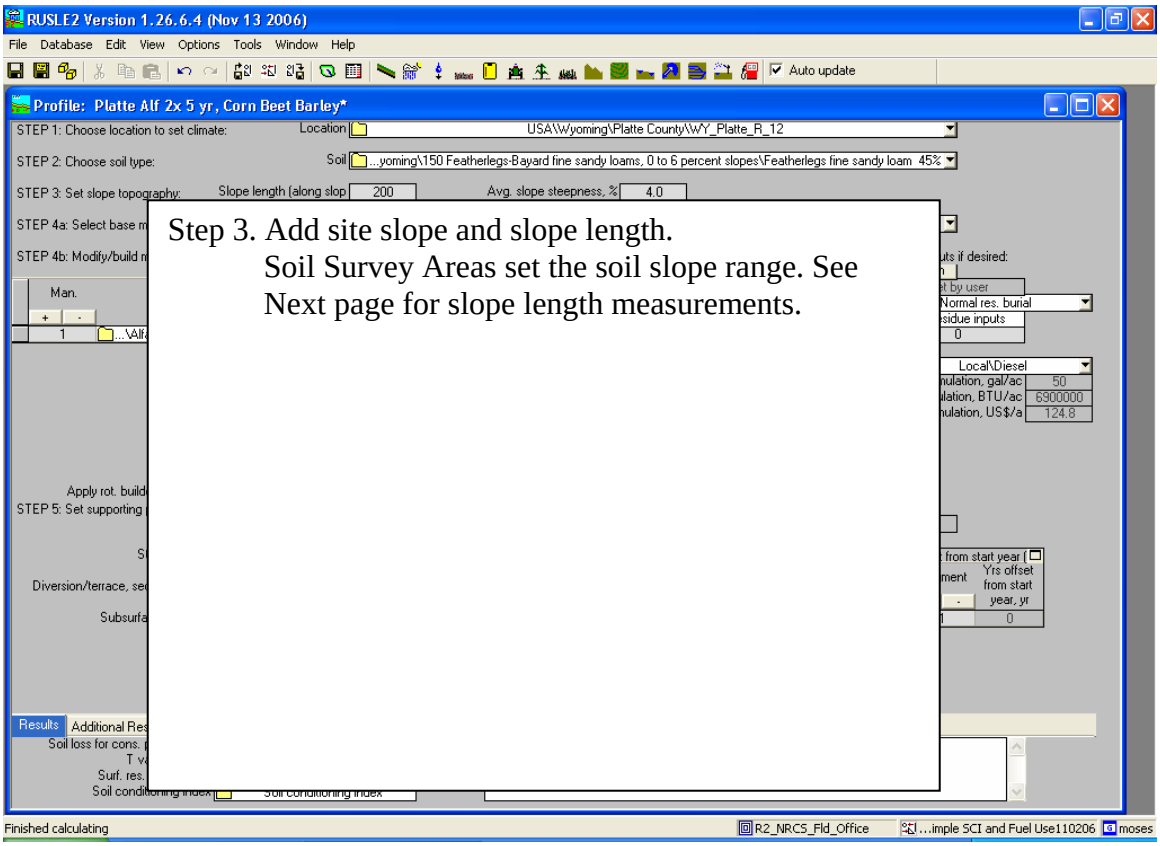
Save profile with new name, not ending with a z7 or z9.

Print report and Save word document after putting producer name and info at top. Save in Customer Toolkit folder: Determinations..



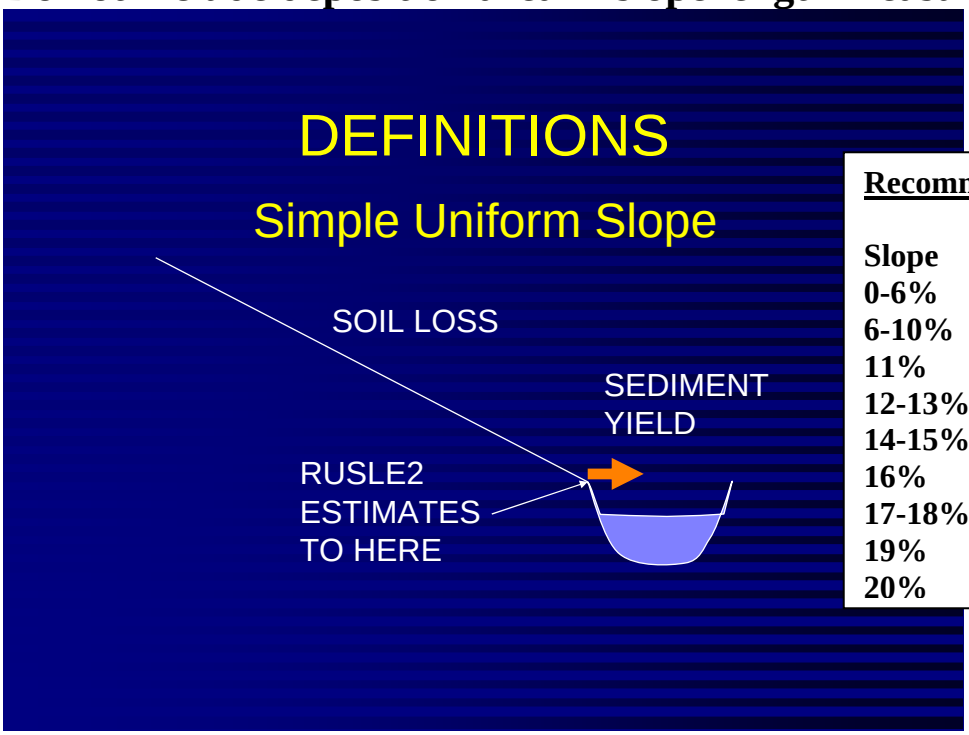


Step 2 Select soil map unit or
generic soil surface texture



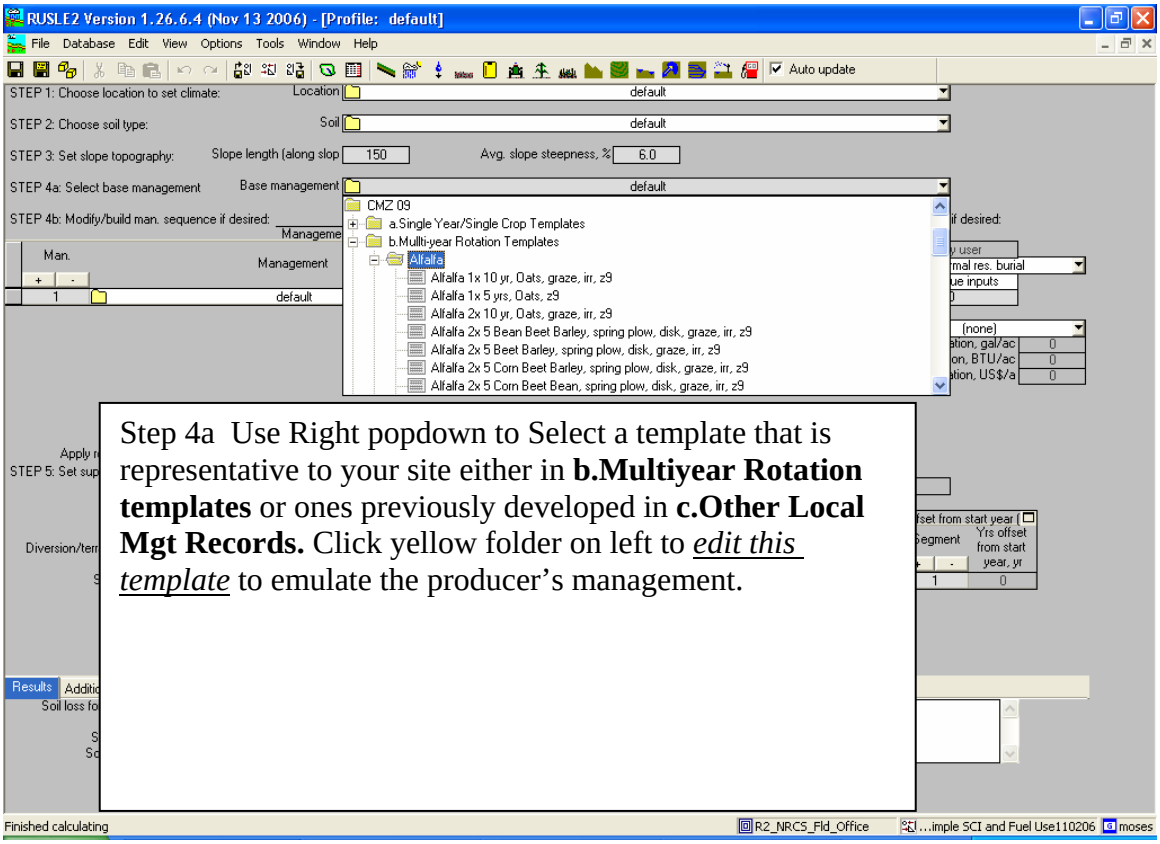
Step 3. Add site slope and slope length.
Soil Survey Areas set the soil slope range. See
Next page for slope length measurements.

Do not include deposition area in slope length measurements.

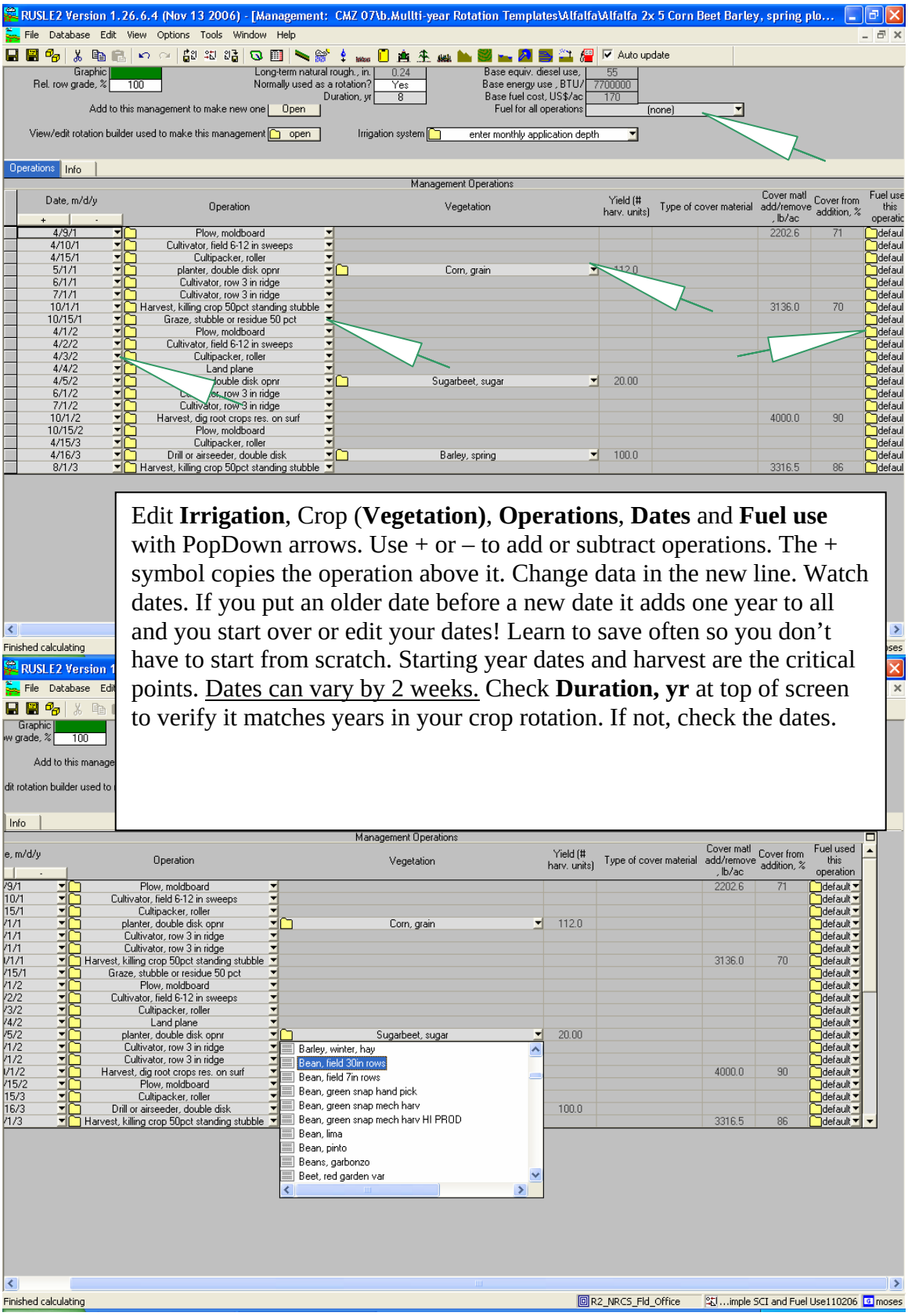


Recommended Guideline

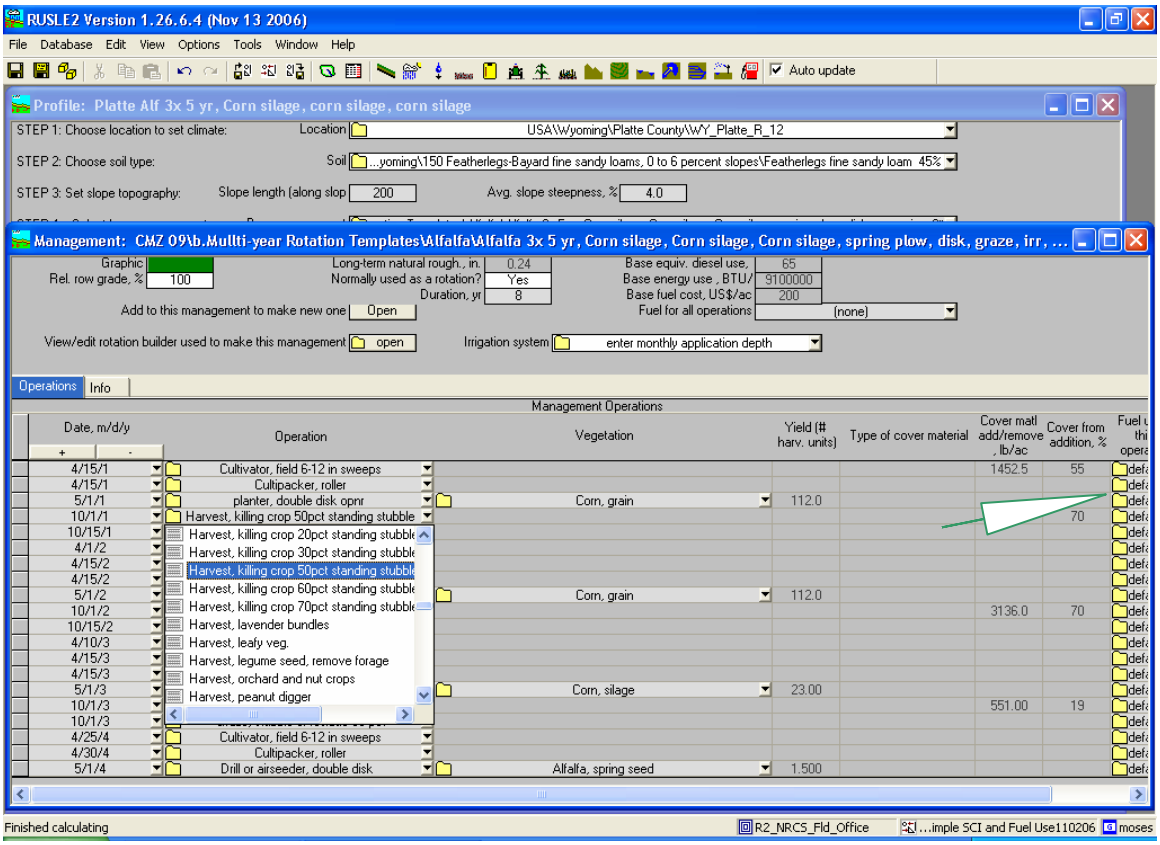
Slope	Length
0-6%	250 ft
6-10%	200 ft
11%	175 ft
12-13%	150 ft
14-15%	125 ft
16%	110 ft
17-18%	100 ft
19%	90 ft
20%	80 ft

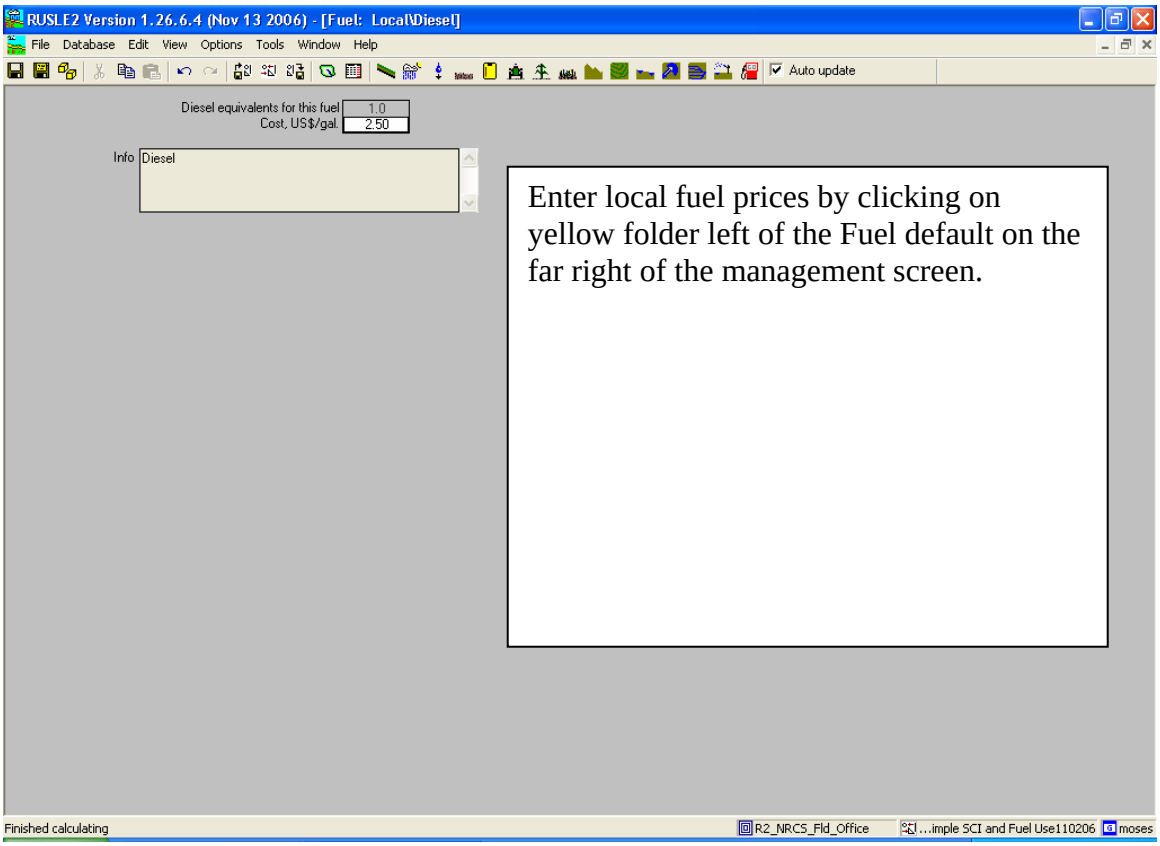


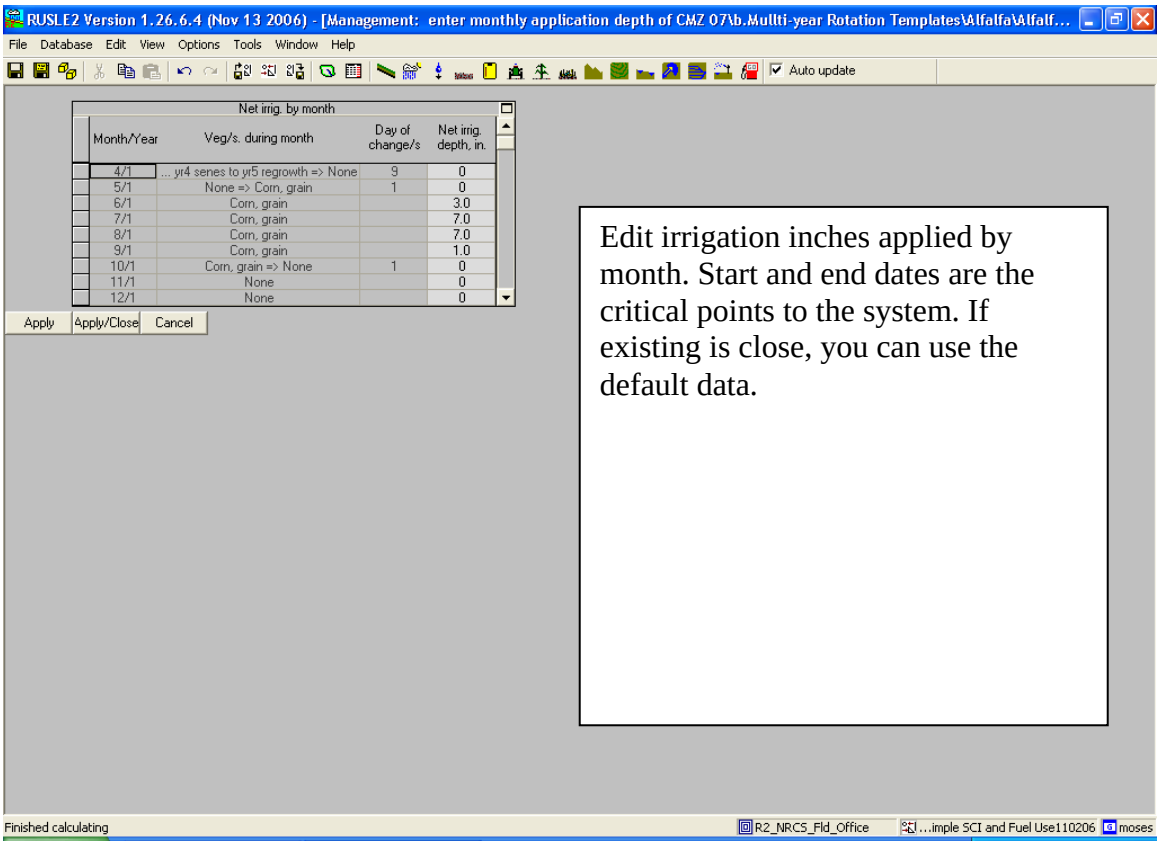
Step 4a Use Right popdown to Select a template that is representative to your site either in **b.Multiyear Rotation templates** or ones previously developed in **c.Other Local Mgt Records.** Click yellow folder on left to *edit this template* to emulate the producer's management.



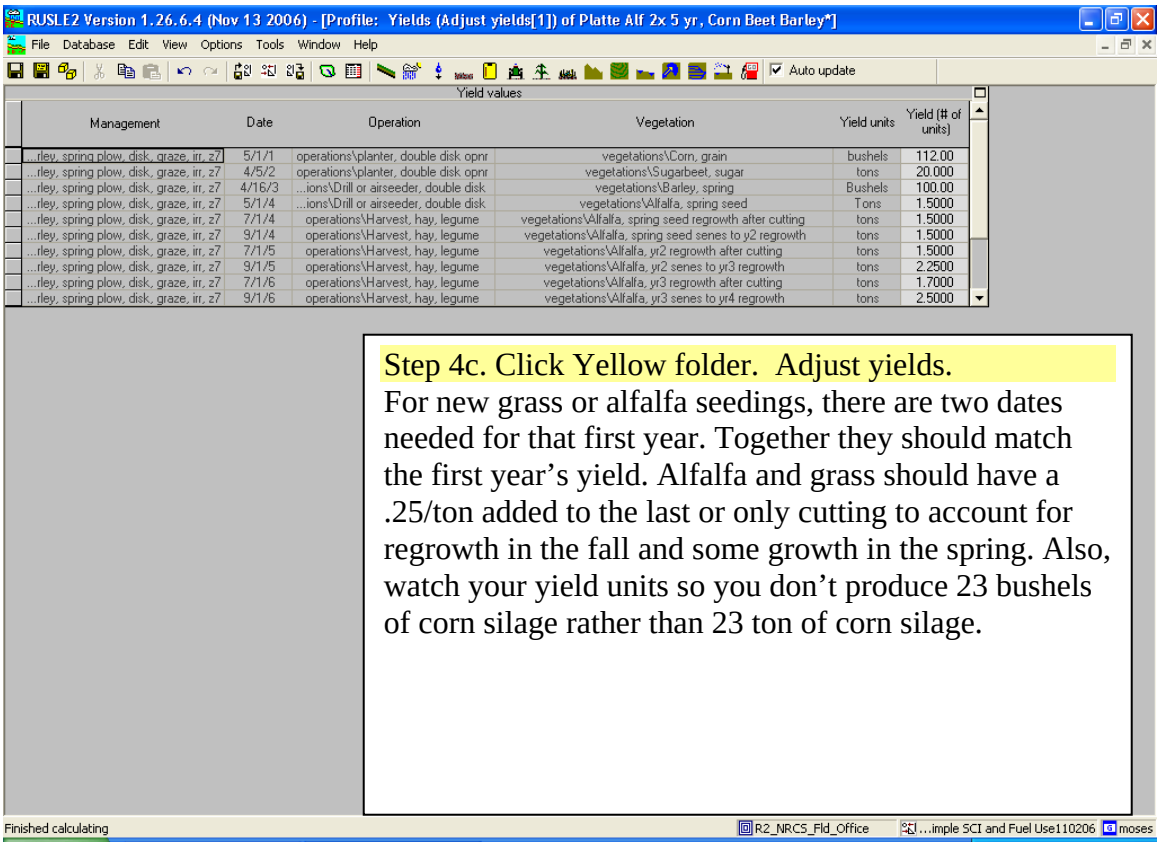
Edit **Irrigation**, Crop (**Vegetation**), **Operations**, **Dates** and **Fuel use** with PopDown arrows. Use + or – to add or subtract operations. The + symbol copies the operation above it. Change data in the new line. Watch dates. If you put an older date before a new date it adds one year to all and you start over or edit your dates! Learn to save often so you don't have to start from scratch. Starting year dates and harvest are the critical points. <u>Dates can vary by 2 weeks.</u> Check **Duration, yr** at top of screen to verify it matches years in your crop rotation. If not, check the dates.


RUSLE2 Version 1.26.6.4 (Nov 13 2006)
File Database Edit View Options Tools Window Help
Auto update
Profile: Platte Alf 3x 5 yr, Corn silage, corn silage, corn silage
STEP 1: Choose location to set climate:
Location
USA\Wyoming\Platte County\WY_Platte_R_12
STEP 2: Choose soil type:
Soil
...yoming\150 Featherlegs-Bayard fine sandy loams, 0 to 6 percent slopes\Featherlegs fine sandy loam 45%
STEP 3: Set slope topography:
Slope length (along slop
200
Avg. slope steepness, %
4.0
Management: CMZ 09\b.Multi-year Rotation Templates\Alfalfa\Alfalfa 3x 5 yr, Corn silage, Corn silage, Corn silage, spring plow, disk, graze, irr, ...
Graphic
Rel. row grade, %
100
Long-term natural rough., in.
0.24
Normally used as a rotation?
Yes
Duration, yr
8
Base equiv. diesel use,
65
Base energy use , BTU/
9100000
Base fuel cost, US$/ac
200
Fuel for all operations
(none)
Add to this management to make new one
Open
View/edit rotation builder used to make this management
open
Irrigation system
enter monthly application depth
Operations
Info
Management Operations
Date, m/d/y
Operation
Vegetation
Yield (# harv. units)
Type of cover material
Cover matl add/remove , lb/ac
Cover from addition, %
4/15/1 Cultivator, field 6-12 in sweeps 1452.5 55
4/15/1 Cultipacker, roller
5/1/1 planter, double disk opnr Corn, grain 112.0
10/1/1 Harvest, killing crop 50pct standing stubble 70
10/15/1 Harvest, killing crop 20pct standing stubble
4/1/2 Harvest, killing crop 30pct standing stubble
4/15/2
4/15/2 Harvest, killing crop 50pct standing stubble
5/1/2 Harvest, killing crop 60pct standing stubble Corn, grain 112.0
10/1/2 Harvest, killing crop 70pct standing stubble 3136.0 70
10/15/2 Harvest, lavender bundles
4/10/3 Harvest, leafy veg.
4/15/3 Harvest, legume seed, remove forage
4/15/3 Harvest, orchard and nut crops
5/1/3 Harvest, peanut digger Corn, silage 23.00
10/1/3 551.00 19
10/1/3
4/25/4 Cultivator, field 6-12 in sweeps
4/30/4 Cultipacker, roller
5/1/4 Drill or airseeder, double disk Alfalfa, spring seed 1.500
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses


RUSLE2 Version 1.26.6.4 (Nov 13 2006) - [Fuel: Local\Diesel]
File Database Edit View Options Tools Window Help
Auto update
Diesel equivalents for this fuel
1.0
Cost, US$/gal.
2.50
Info
Diesel
Enter local fuel prices by clicking on yellow folder left of the Fuel default on the far right of the management screen.
Finished calculating
R2_NRCS_Fld_Office
...imple SCI and Fuel Use110206
moses

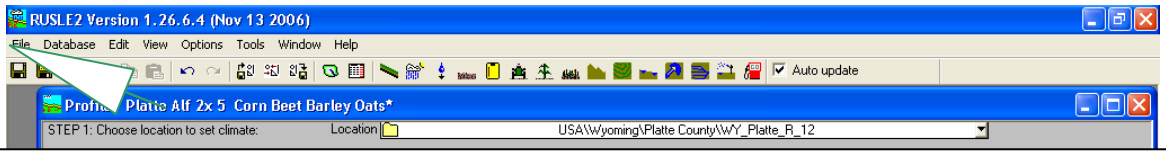


Edit irrigation inches applied by month. Start and end dates are the critical points to the system. If existing is close, you can use the default data.

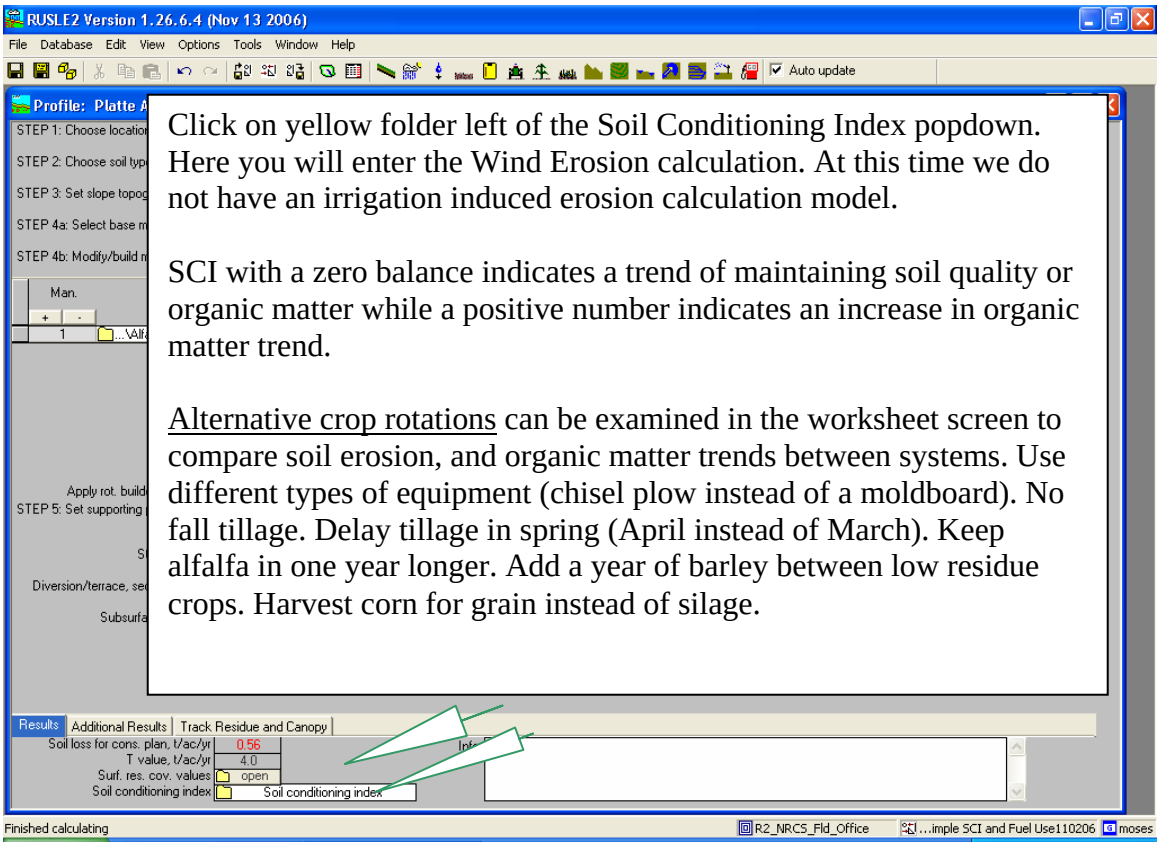


Step 4c. Click Yellow folder. Adjust yields.

For new grass or alfalfa seedings, there are two dates needed for that first year. Together they should match the first year's yield. Alfalfa and grass should have a .25/ton added to the last or only cutting to account for regrowth in the fall and some growth in the spring. Also, watch your yield units so you don't produce 23 bushels of corn silage rather than 23 ton of corn silage.



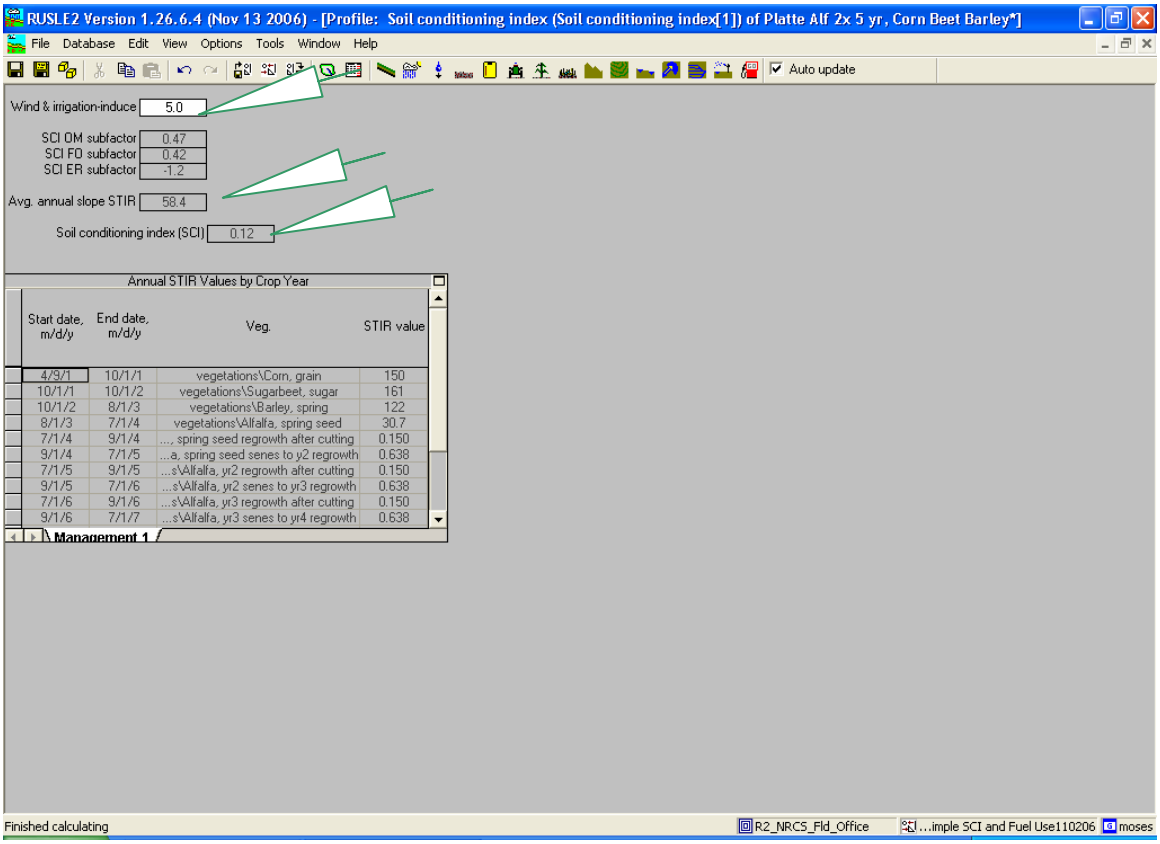
- Save your edits by clicking **Save** after **"Save temp management as permanent"** (middle of screen). **Rename** file name**,** ending with a z7 or z9. At the top of the screen click the **yellow arrow until you find c.Other Local Mgt Records.** (You cannot save in the management/b.Multiyear Rotation) Click on **Save** at the bottom right of the screen. ***Minimize***. Be consistant in using only one crop management-- z7 or z9, with ever is closest to your area. This is saved in the yellow clipboard icon (Management). Verify Step 4b. is named the same as 4a.
- ***Save your profile*** from **File** at top left of screen and **Save As.** Type a new **File Name** by management or project. (Don't end with a z7 or z9) Click on **Save** in the bottom right corner. This is saved in the Profile--green slash icon. (The Profile evaluates the climate, soils with crop managements.) If you don't save in this order, you will have no management template for the profile to link back to. You will have to delete your profile and start over. See Rearrange to delete or edit files.

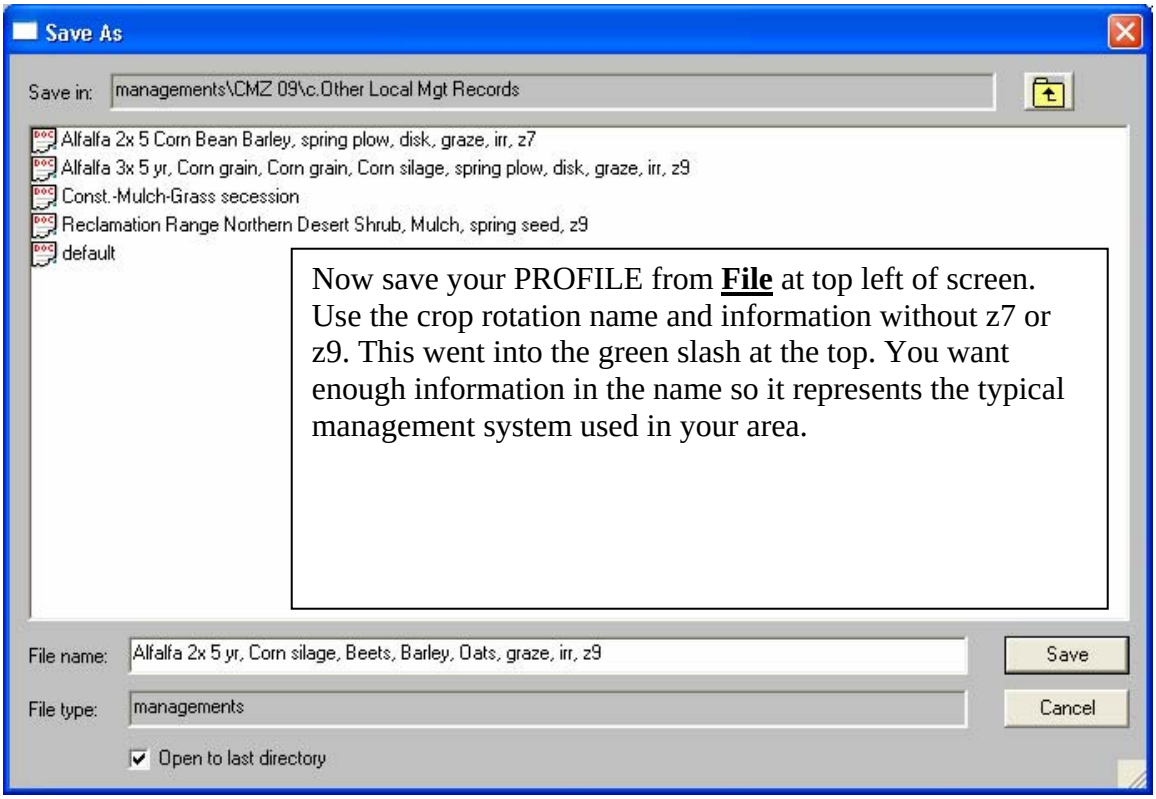


Click on yellow folder left of the Soil Conditioning Index popdown. Here you will enter the Wind Erosion calculation. At this time we do not have an irrigation induced erosion calculation model.

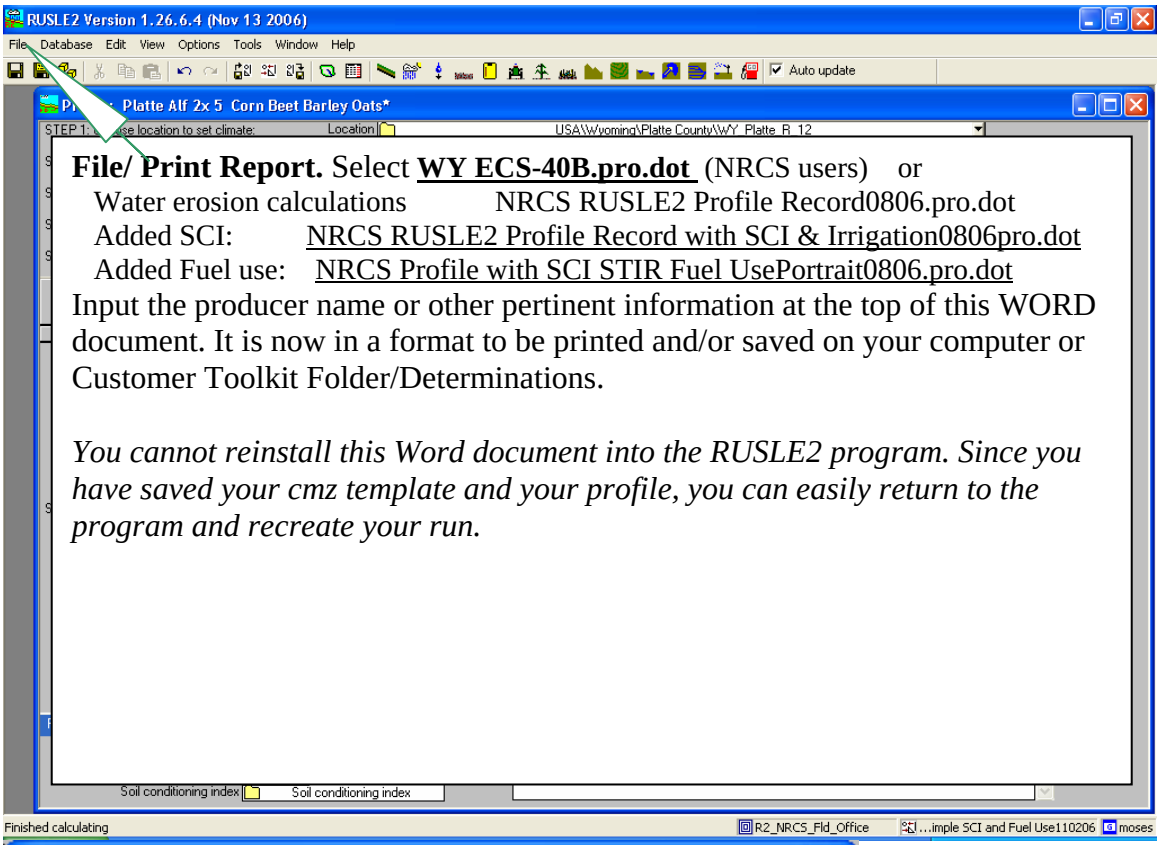
SCI with a zero balance indicates a trend of maintaining soil quality or organic matter while a positive number indicates an increase in organic matter trend.

Alternative crop rotations can be examined in the worksheet screen to compare soil erosion, and organic matter trends between systems. Use different types of equipment (chisel plow instead of a moldboard). No fall tillage. Delay tillage in spring (April instead of March). Keep alfalfa in one year longer. Add a year of barley between low residue crops. Harvest corn for grain instead of silage.





Now save your PROFILE from **File** at top left of screen. Use the crop rotation name and information without z7 or z9. This went into the green slash at the top. You want enough information in the name so it represents the typical management system used in your area.



File/ Print Report. Select **WY ECS-40B.pro.dot** (NRCS users) or

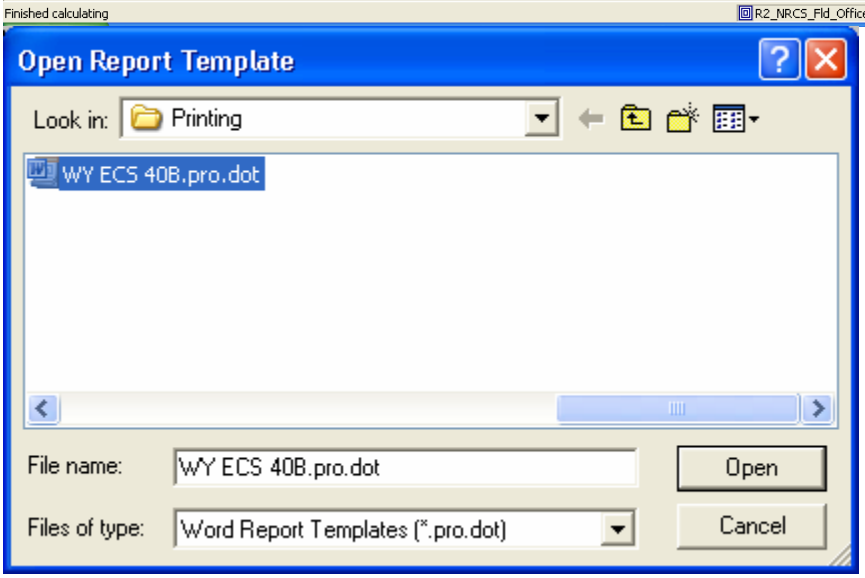
Water erosion calculations NRCS RUSLE2 Profile Record0806.pro.dot

Added SCI: NRCS RUSLE2 Profile Record with SCI & Irrigation0806pro.dot

Added Fuel use: NRCS Profile with SCI STIR Fuel UsePortrait0806.pro.dot

Input the producer name or other pertinent information at the top of this WORD document. It is now in a format to be printed and/or saved on your computer or Customer Toolkit Folder/Determinations.

You cannot reinstall this Word document into the RUSLE2 program. Since you have saved your cmz template and your profile, you can easily return to the program and recreate your run.



RUSLE2 New Profile STIR SCI Fuel.doc - Microsoft Word

RUSLE2 Profile Erosion Calculation Record

Info:

File: profiles\Platte Alf 2x 5_Corn Beet Barley Oats
Access Group: R2_NRCS_Fld_Office

Inputs:

Location	*Soil*	*Slope length (horiz)*	*Avg. slope steepness, %*
Wyoming\Platte County\WY_Platte_R_12	150 Featherlegs-Bayard fine sandy loams, 0 to 6 percent slopes\Featherlegs fine sandy loam 45%	200	4.0

FUEL USE EVALUATION:

Fuel type for entire run	*Equiv. diesel use for entire simulation*	*Energy use for entire simulation*	*Fuel cost for entire simulation, US$/ac*
(none)	56	7800000	169.2

SCI and STIR Output

Soil conditioning index (SCI)	*Avg. annual slope STIR*	*Wind & irrigation-induced erosion for SCI, t/ac/yr*
-0.019	69.8	5.0

Outputs:

T value	*Soil loss erod. portion*	*Detachment on slope*	*Soil loss for cons. plan*	*Sediment delivery*	*Net C factor*	*Net K factor*	*Crit. slope length*	*Surf. cover after planting, %*
4.0	0.77	0.77	0.77	0.77	0.11	0.48		

Management	*Vegetation*	*Yield units*	*Yield (# of units)*
CMZ 09\b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Oats, graze, irr, z9	Corn, silage	tons	23.000
CMZ 09\b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Oats, graze, irr, z9	Sugarbeet, sugar	tons	20.000

RUSLE2 Version 1.26.6.4 (Nov 13 2006)

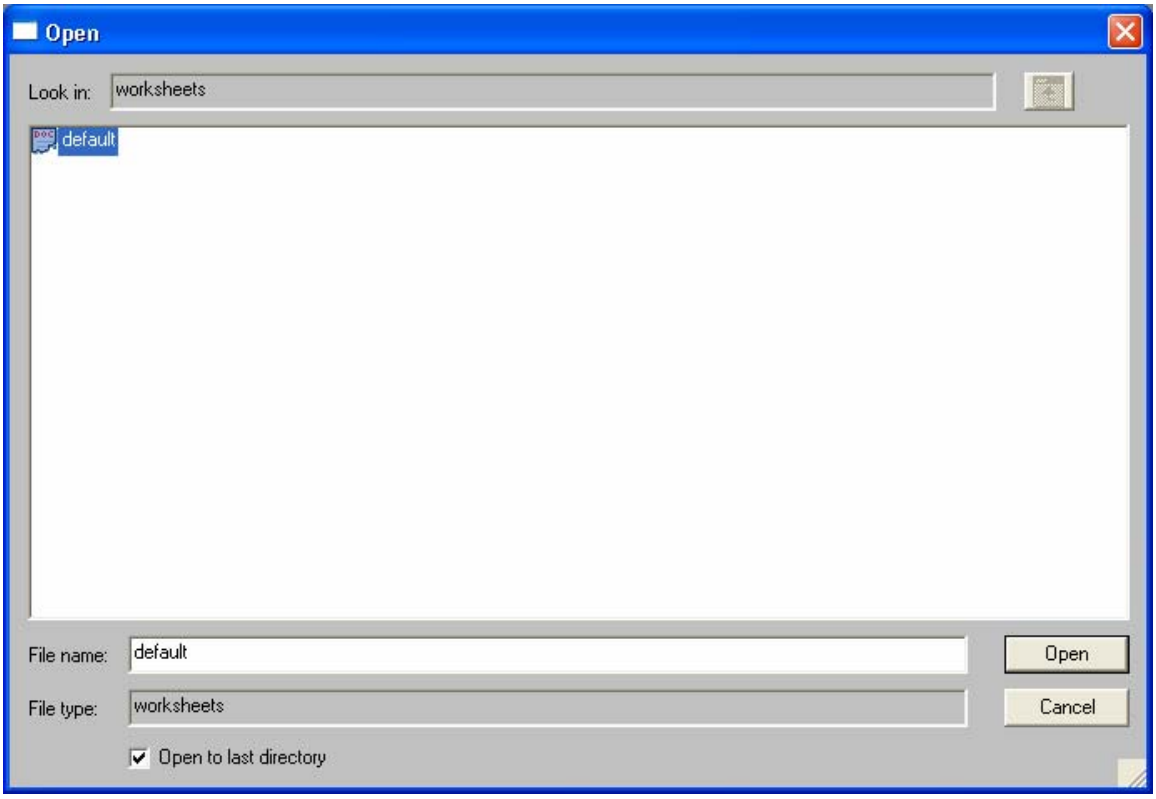
Open worksheet...

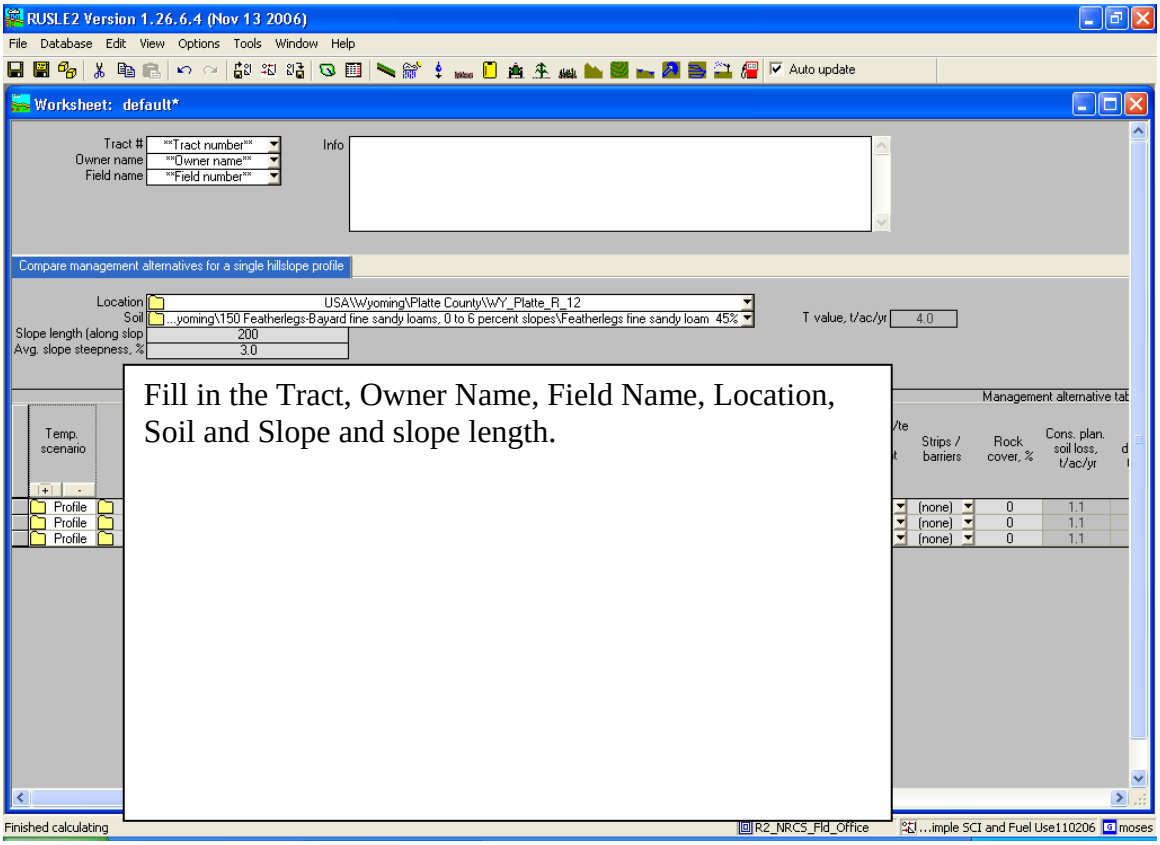
WORKSHEET

A worksheet is comprised of one or more profiles. The outputs of each profiles's soil erosion, soil quail (SCI) can be evaluated. These comparisons are alternatives to present to the producer. The worksheet visibly shows the benefits of one cropping system of crop rotation, tillage operations, over another.

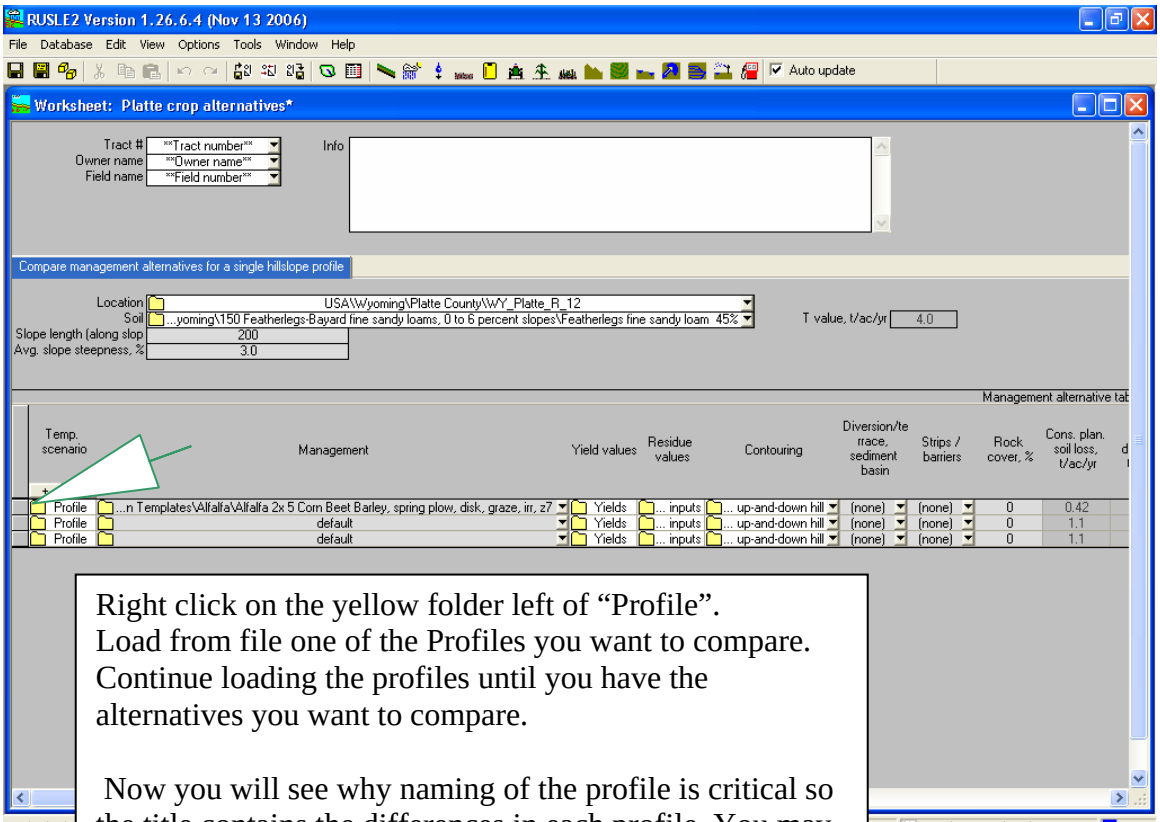
The worksheet is commonly named with the producer's name.

Click on the icon to open the worksheet and then click default to enter a new worksheet.



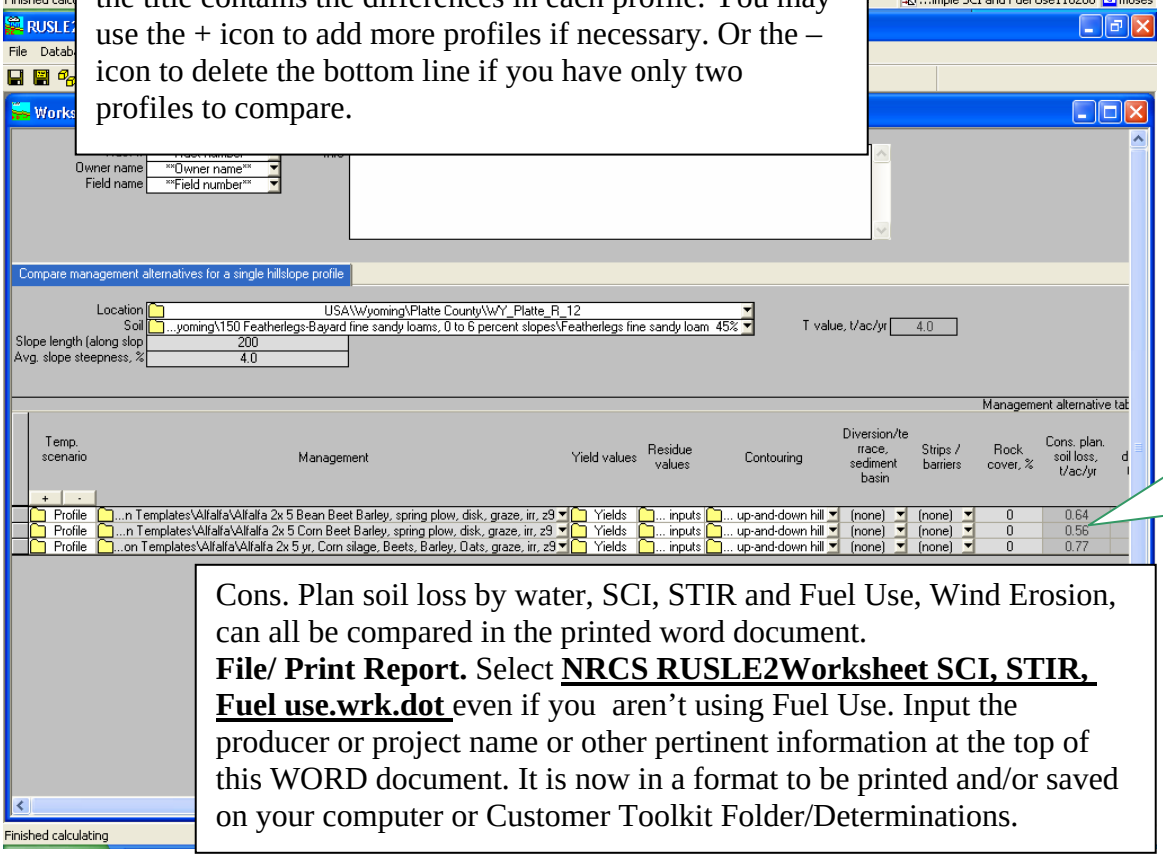


Fill in the Tract, Owner Name, Field Name, Location, Soil and Slope and slope length.

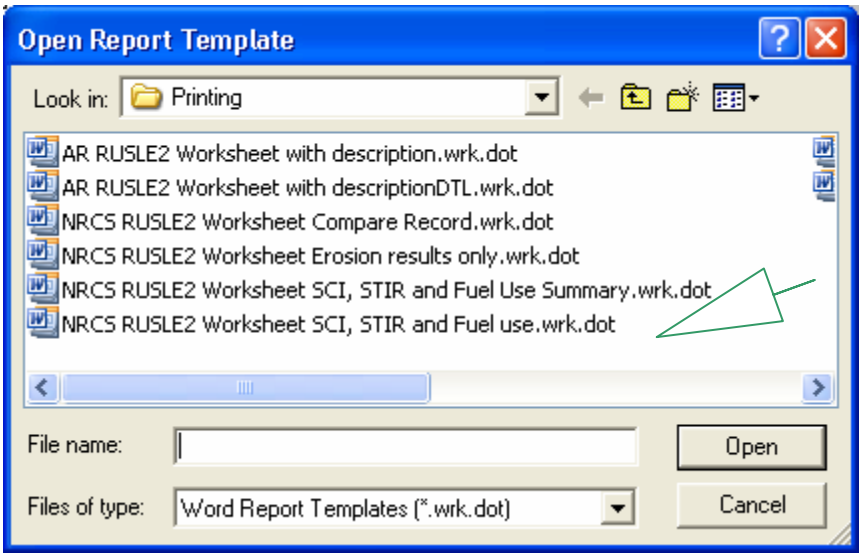


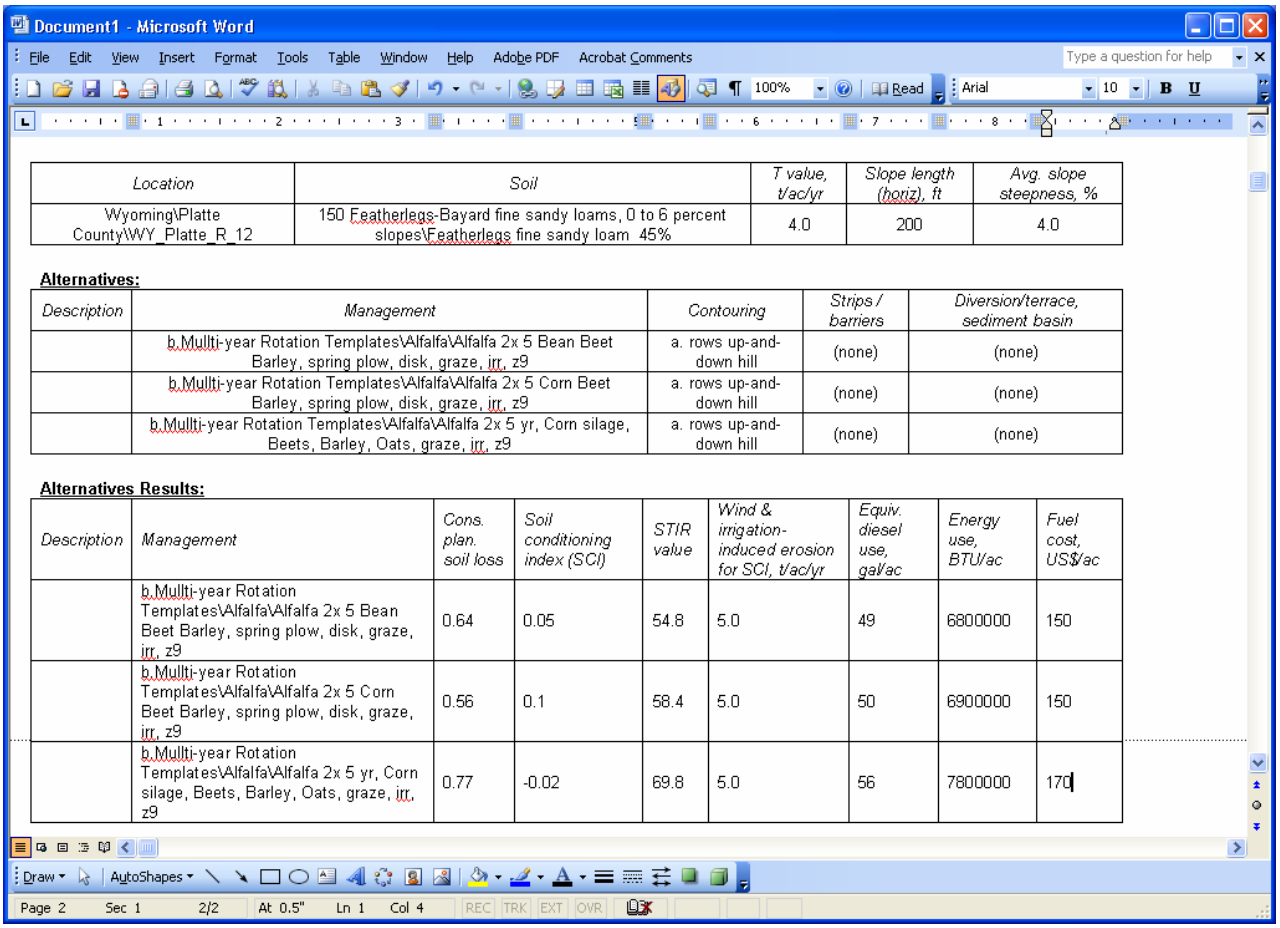
Right click on the yellow folder left of "Profile". Load from file one of the Profiles you want to compare. Continue loading the profiles until you have the alternatives you want to compare.

Now you will see why naming of the profile is critical so the title contains the differences in each profile. You may use the + icon to add more profiles if necessary. Or the – icon to delete the bottom line if you have only two profiles to compare.



Cons. Plan soil loss by water, SCI, STIR and Fuel Use, Wind Erosion, can all be compared in the printed word document.
File/ Print Report. Select **<u>NRCS RUSLE2Worksheet SCI, STIR, Fuel use.wrk.dot</u>** even if you aren't using Fuel Use. Input the producer or project name or other pertinent information at the top of this WORD document. It is now in a format to be printed and/or saved on your computer or Customer Toolkit Folder/Determinations.





Document1 - Microsoft Word

Location	Soil	T value, t/ac/yr	Slope length (horiz), ft	Avg. slope steepness, %
Wyoming\Platte County\WY_Platte_R_12	150 Featherlegs-Bayard fine sandy loams, 0 to 6 percent slopes\Featherlegs fine sandy loam 45%	4.0	200	4.0

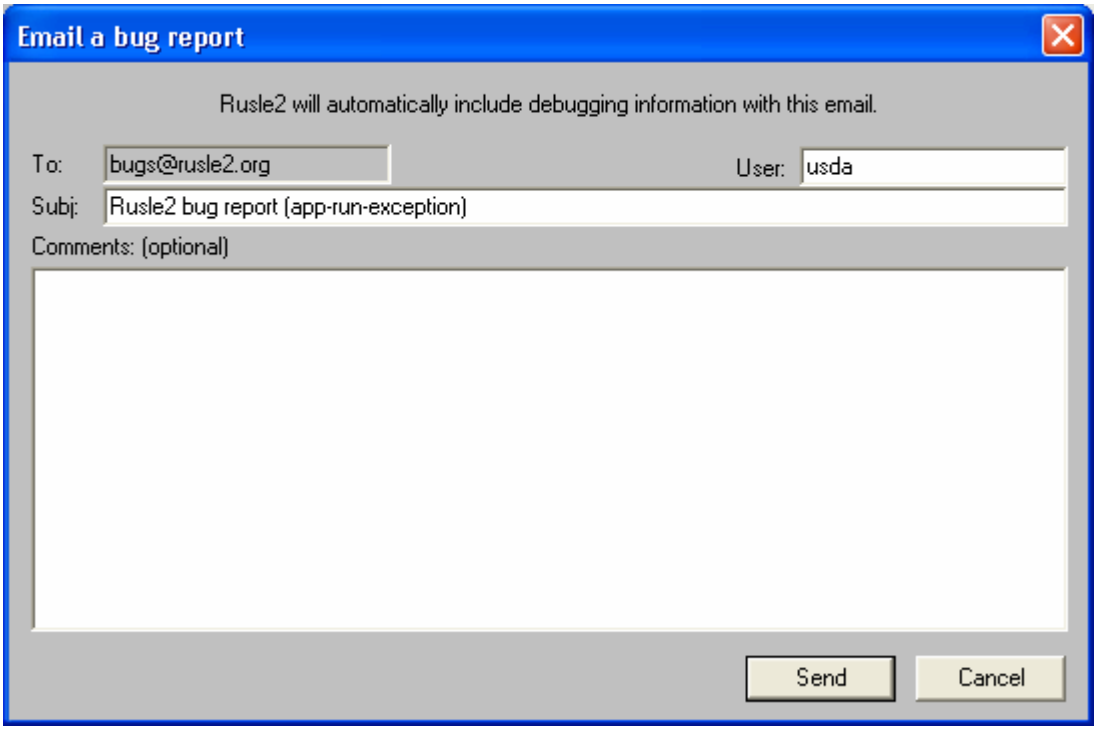
Alternatives:

Description	Management	Contouring	Strips / barriers	Diversion/terrace, sediment basin
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 Bean Beet Barley, spring plow, disk, graze, irr, z9	a. rows up-and-down hill	(none)	(none)
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 Corn Beet Barley, spring plow, disk, graze, irr, z9	a. rows up-and-down hill	(none)	(none)
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Oats, graze, irr, z9	a. rows up-and-down hill	(none)	(none)

Alternatives Results:

Description	Management	Cons. plan. soil loss	Soil conditioning index (SCI)	STIR value	Wind & irrigation-induced erosion for SCI, t/ac/yr	Equiv. diesel use, gal/ac	Energy use, BTU/ac	Fuel cost, US$/ac
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 Bean Beet Barley, spring plow, disk, graze, irr, z9	0.64	0.05	54.8	5.0	49	6800000	150
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 Corn Beet Barley, spring plow, disk, graze, irr, z9	0.56	0.1	58.4	5.0	50	6900000	150
	b.Mullti-year Rotation Templates\Alfalfa\Alfalfa 2x 5 yr, Corn silage, Beets, Barley, Oats, graze, irr, z9	0.77	-0.02	69.8	5.0	56	7800000	170

Now save your WORKSHEET from **File** at top left of screen. Use the producer or project name and information without z7 or z9. This went into the worksheet icon at the top of the screen.

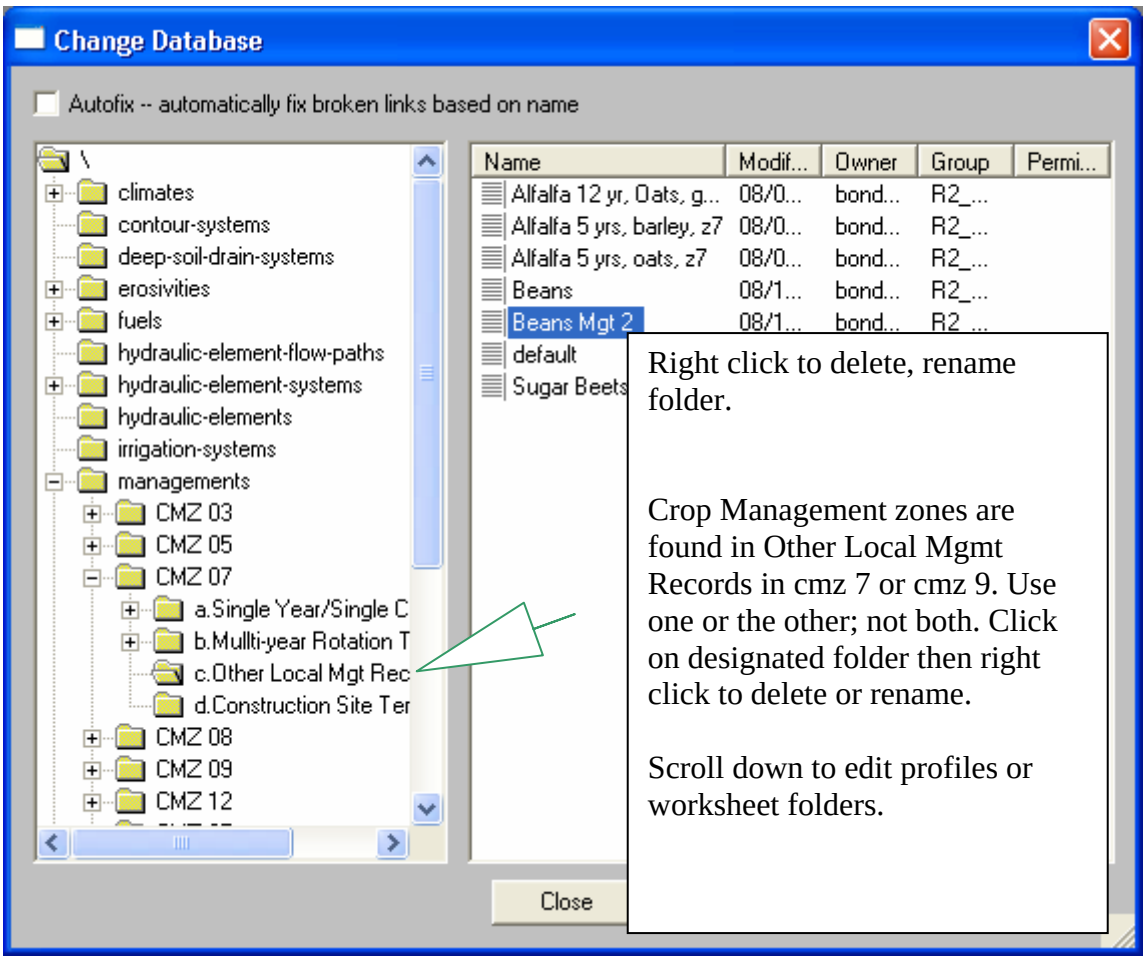


There will be errors.!!!! Don't send a bug report ever…
Just close the program, open it again.

RENAME, DELETE folders you have developed in cmz7 or cmz9, profiles and worksheets.

Select Database tab at top left, Rearrange. This will allow you to select the database and folder you wish to highlight file, right click to delete or rename file. For Crop management files see Other Local Records, CMZ 07 or CMZ 09.

Be careful. If you are renaming a crop management template, and it was used in Profile or Worksheet, you will cause that Profile or Worksheet 's crop management template to go back to default, as it lost the path to the crop management zone it was developed under. This is an easy fix, just select yes to go to default. Then select popdown on 4A and select a crop management zone.



Read your manual first but if questions and concerns still arise, contact:

Bonda Habets
NRCS WY State Agronomist
(307) 233-6767
Casper State Office
Bonda.Habets@wy.usda.gov