



**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES



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# **A farmer-friendly Soil Organic Matter Calculator**

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**Project funded by**

## **Ohio Soybean Council**



## **Corn Marketing Program of Michigan**



**Project Investigators**

**Rafiq Islam, Vinayak Shedekar & Randall Reeder**

The Ohio State University

**Jerry Grigar**

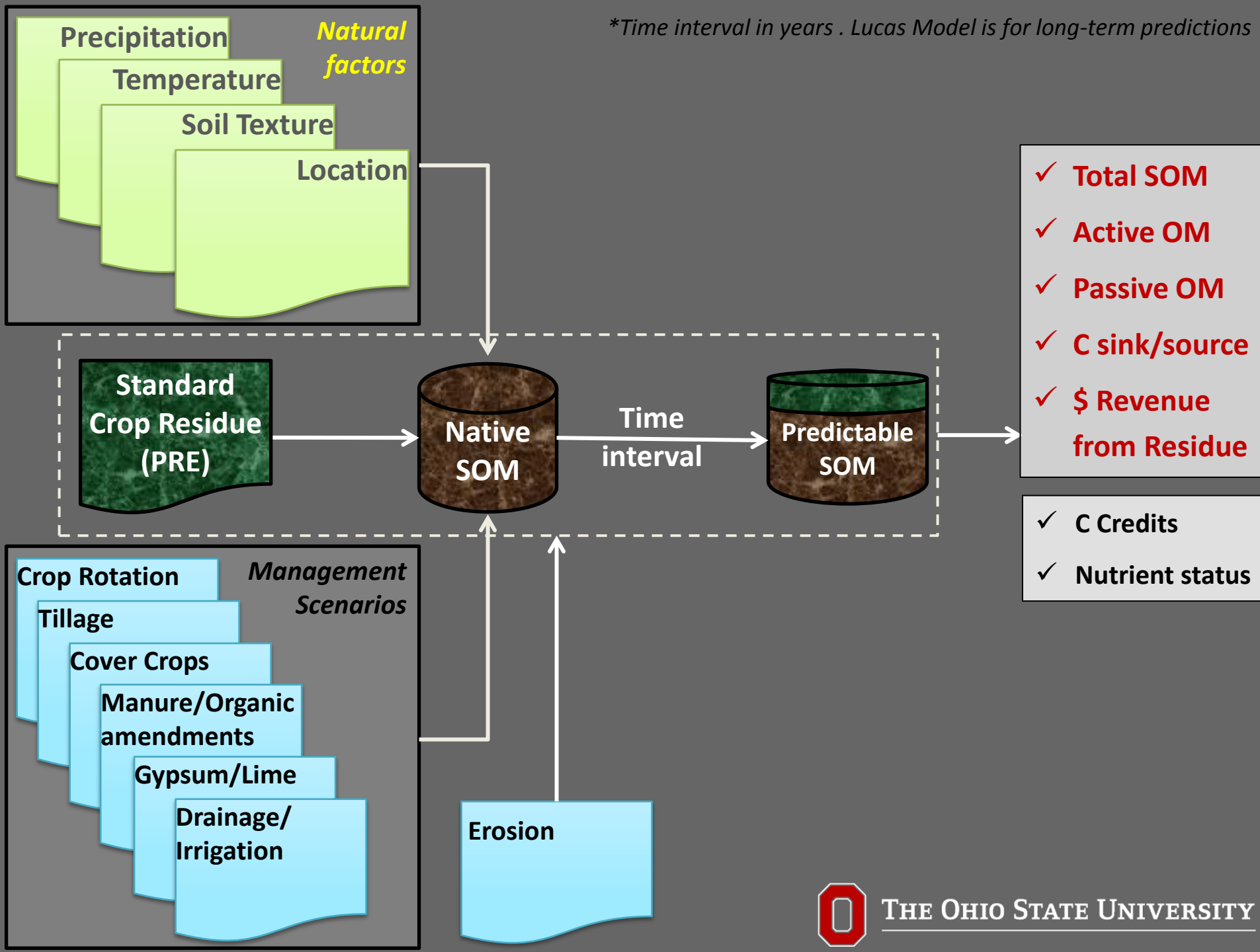
USDA-NRCS Michigan, State Agronomist



# Overview of OSU SOM Calculator Ver. 2.0

- ☐ Theoretical basis
- ☐ Interface
- ☐ Validity of the tool
- ☐ Downloading the tool

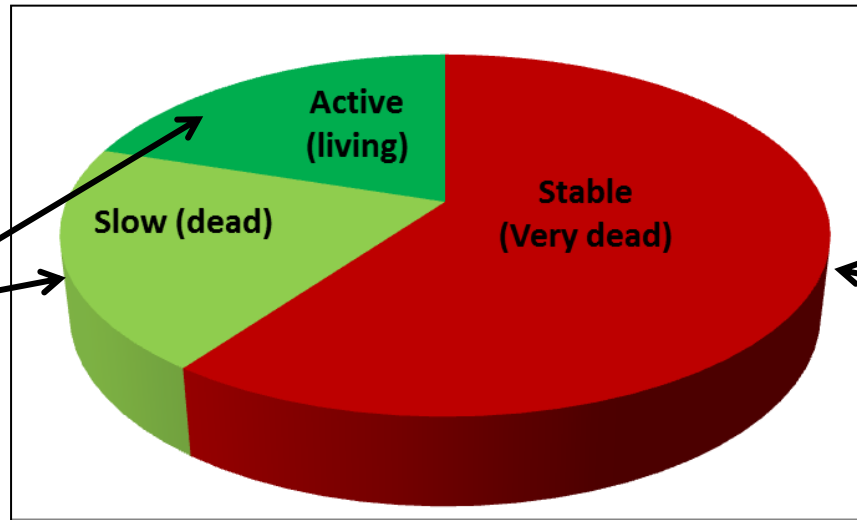
*\*Time interval in years . Lucas Model is for long-term predictions*





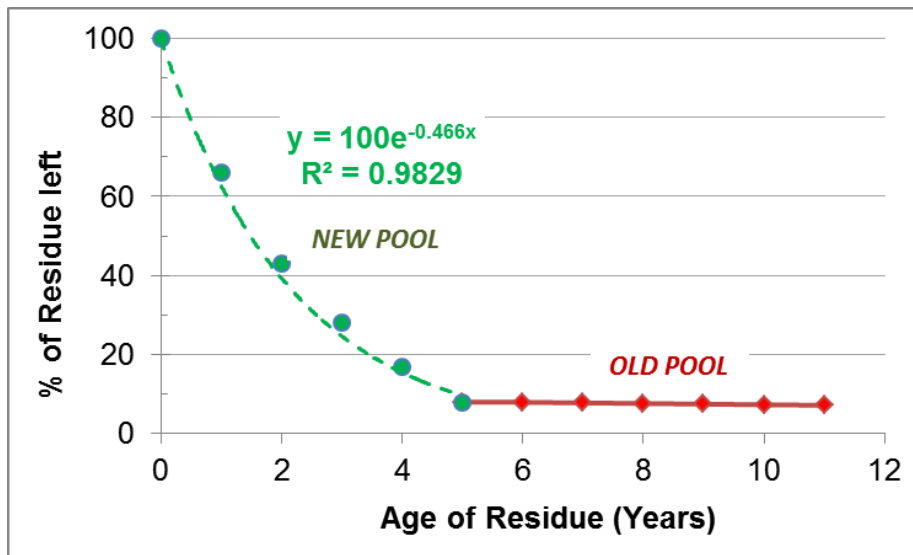
# Soil Organic Matter Pools

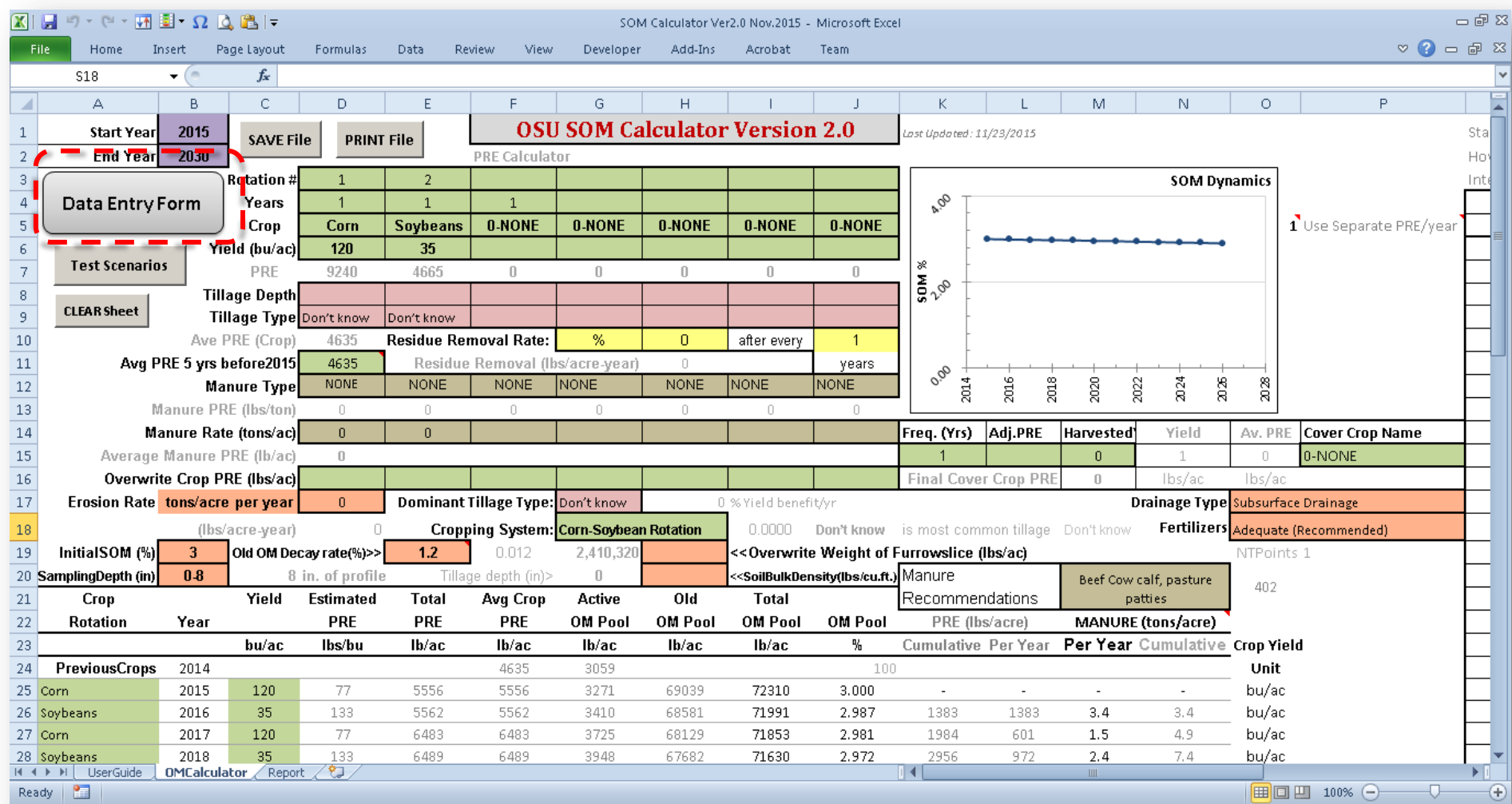
1. NEW  
OM



2. OLD  
OM

2-Pool decay model  
for PRE  
(developed by Dr. Lucas)







frmCropRotation

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**SIMULATION PERIOD**

Start Year: 2015 End Year: 2030 No. of Years: 16 SKIP ☒

SAVE YEARS

**CROP ROTATION**

Please enter information for crop#1 in your crop rotation

Crop: Corn continuously for 1 years, with 120 bu/ac Enter Yield

Based on crop and yield, suggested Plant Residue Equivalent is 9240 lbs/ac

If you would like to change the PRE, just change the value in the text box above

SKIP ☐

**Select Tillage**

Use the same Tillage Type and depth for all crop rotations ☐

Tillage Type: Don't know Tillage depth (optional): in.

OR Enter weight of Furrow Slice (lbs/ac) - Optional:

**Manure Application**

Manure type: NONE 0 tons/ac Use the same manure type and rate for all crop rotations ☐

SAVE & Go to Next Crop >>

- Done - GoTo Next Page>>

Start Over

**Review your Crop Rotation**

Rotation #	1	2	3	4
Years	1	1	1	
Crop	Corn	Soybeans	0-NONE	0-NONE
Yield (bu/ac)	120	40		
PRE	9240	5331	0	0

<< Viewer

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frmCropRotation

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**ORGANIC MATTER BASELINE**

☒ Use same crop rotation for 5 years before  SKIP ☐

☐ Use different crop rotation for 5 years before

Soil OM in Start Year  % Sampling Depth

Old OM decay rate  % per year 

Click to Close Cover Crops, Soil & Management Info Panel

Management Cover Crops Erosion

You have selected Tillage

What best describes your cropping system?

Select Drainage Type

How would you describe your fertilizer application?  Save & Next Page >>



- Done -  
GoTo  
Next  
Page>>


**Review your Crop Rotation**

Rotation #	1	2		
Years	1	1	1	
Crop	Corn	Soybeans	0-NONE	0-NONE
Yield (bu/ac)	120	35		
PRE	9240	4665	0	0

<< Viewer

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**ORGANIC MATTER BASELINE**

☒ Use same crop rotation for 5 years before  SKIP ☐

☐ Use different crop rotation for 5 years before

Soil OM in Start Year  % Sampling Depth

Old OM decay rate  % per year 

Done

Click to Close Cover Crops, Soil & Management Info Panel

Management Cover Crops Erosion

Select Cover Crop

After Every  Year

Mix With

If you harvested (removed) any portion of this cover crop, please enter the relevant values below:

☐ Harvested Height of crop  % of Total  Estimated

☐ Harvested Yield of crop  % of Total  lbs/ac

☒ No Harvest

Save & Next Page >>



- Done -  
GoTo  
Next  
Page>>


**Review your Crop Rotation**

Rotation #	1	2		
Years	1	1	1	
Crop	Corn	Soybeans	0-NONE	0-NONE
Yield (bu/ac)	120	35		
PRE	9240	4665	0	0

<< Viewer

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**ORGANIC MATTER BASELINE**

☒ Use same crop rotation for 5 years before  SKIP ☐

☐ Use different crop rotation for 5 years before

Soil OM in Start Year  % Sampling Depth

Old OM decay rate  % per year  Done

Click to Close Cover Crops, Soil & Management Info Panel

Management Cover Crops Erosion

Rate of soil erosion from field  tons/acre per year

Save Erosion Rate



- Done -  
GoTo  
Next  
Page>>


**Review your Crop Rotation**

Rotation #	1	2		
Years	1	1	1	
Crop	Corn	Soybeans	0-NONE	0-NONE
Yield (bu/ac)	120	35		
PRE	9240	4665	0	0

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**SCENARIO & MODEL RUN**

Annual Residue Removal Rate  lbs/acre ▾

After every  years



**CALCULATE**


**Review your Crop Rotation**

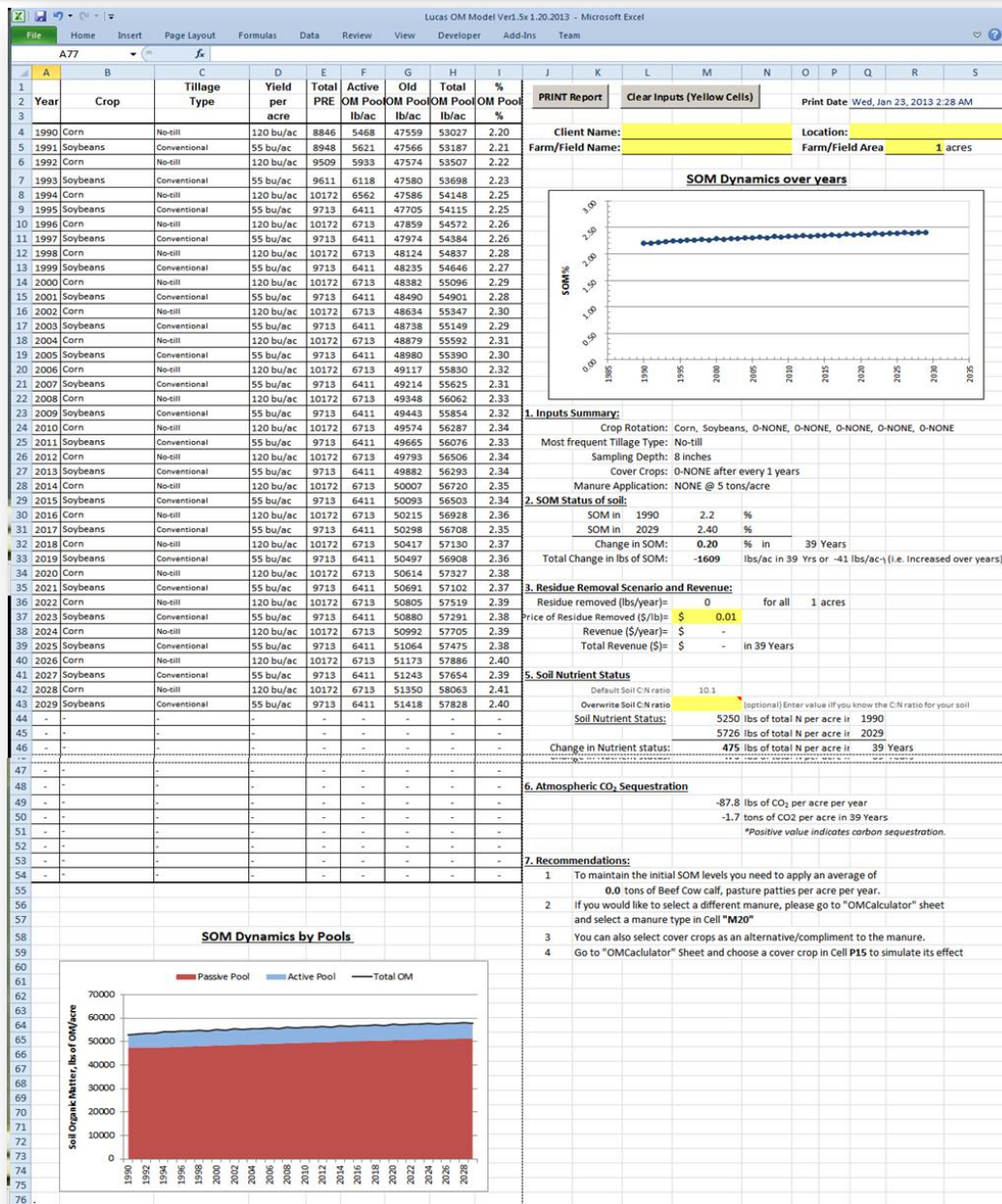
Rotation #	1	2		
Years	1	1	1	
Crop	Corn	Soybeans	0-NONE	0-NONE
Yield (bu/ac)	120	35		
PRE	9240	4665	0	0

<< Viewer

**CANCEL**

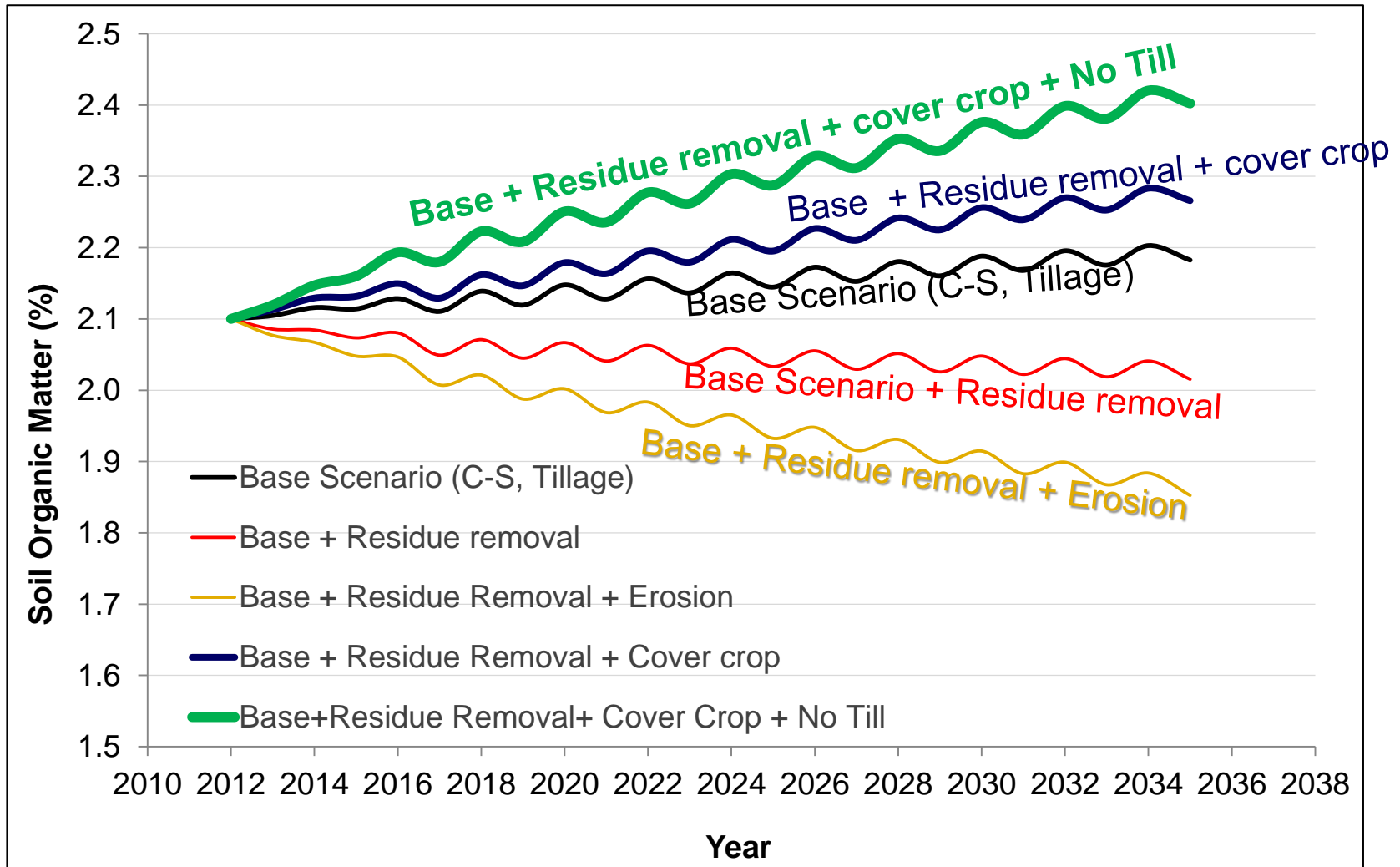
 

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# Sensitivity of SOM Calculator

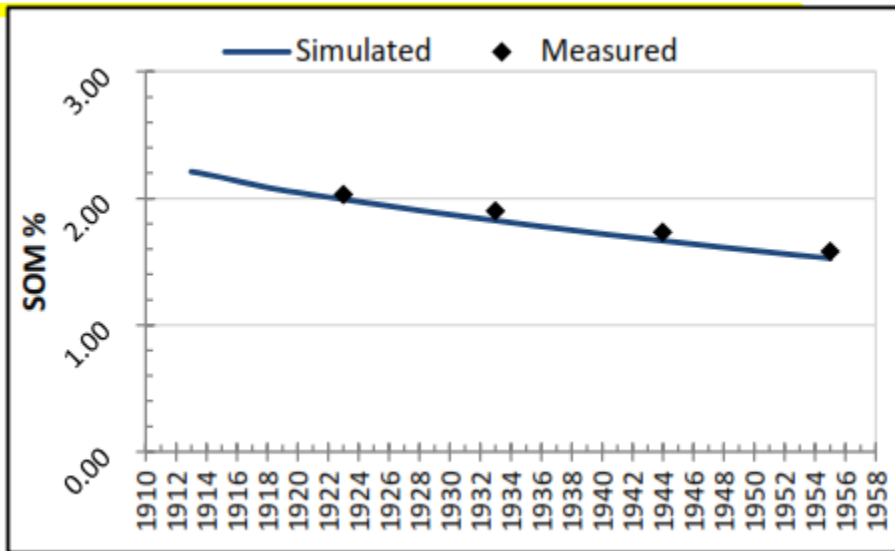




# Is the Calculator Accurate?

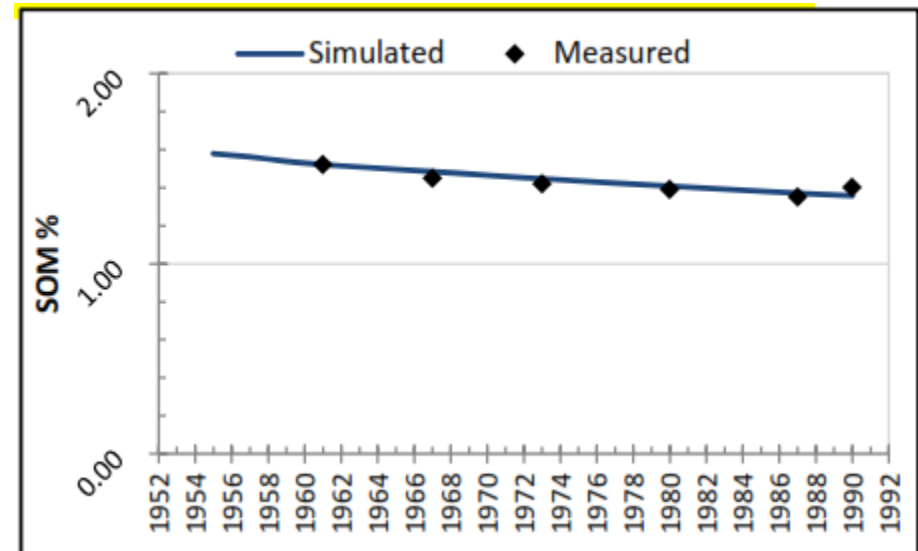
## Morrow Plots - Continuous Corn (North-C)

1913-55



2.21 to 1.58 (in 42 years)

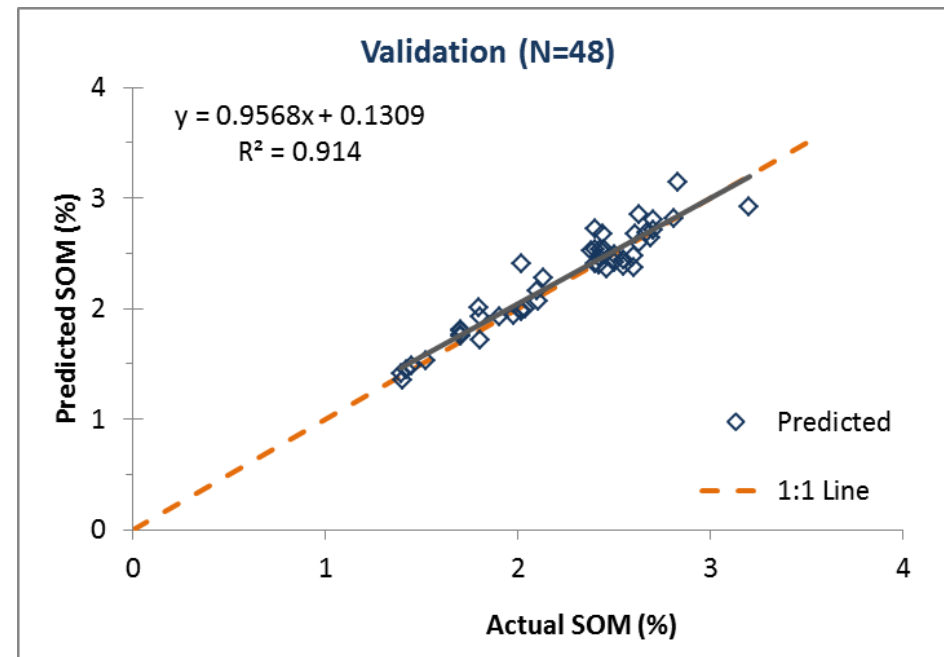
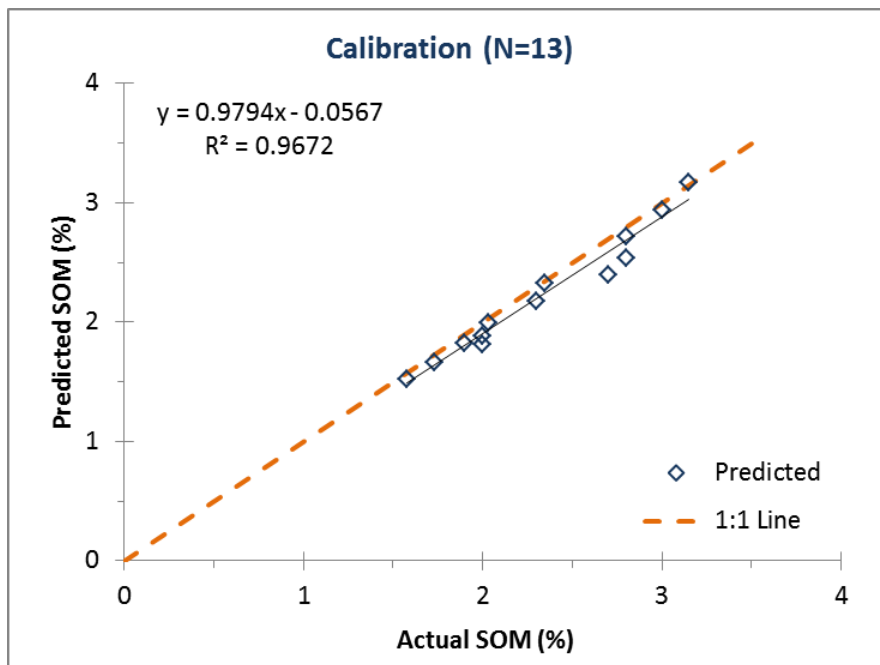
1955-90  
(corn hybrids)



1.58 to 1.4 (in 35 years)



# Performance evaluation



Data from 11 different experiments in Michigan and Illinois



## Where to get it?

- The SOM calculator is available after due request. Please visit the following link for more details:
- <http://go.osu.edu/SOMCalculator>
- <http://southcenters.osu.edu>

