Soil Erosion – What will the future bring?

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Soil Erosion

- Sediment - Iowa’s #1 water quality problem
- Loss in U.S. productivity > $25 billion*
- Off site U.S. costs $17 billion*
- Annual world wide > $400 billion*

Does soil erosion affect corn yield?

What is tolerable soil loss and why is it important?

- Soil loss rate which equals the soil formation rate.

  - Clarion soil $T = 5 \text{ tons/acre/year}$
  - Nicollet soil $T = 5 \text{ tons/acre/year}$
  - Webster soil $T = 5 \text{ tons/acre/year}$
Soil Formation

Climate
Plants
Topography
Parent Material
Time

Processes
Soil Development – Northern Iowa/Southern Minnesota

14,000 Years
Are $T$ values correct?

C-N-W soils about 36” deep*

C-N-W soils about 14,000 years old.

Each year how many tons of soil developed?

$$= 36 \text{ in}/14,000 \text{ years} = 0.003 \text{ in/year}$$

Acre of soil 1” deep = 333,333 lbs.

$$\frac{333,333 \text{ lbs}}{\text{in}} \times \frac{0.003 \text{ in}}{\text{yr}} = 1,000 \text{ lbs/yr}$$

*Thomas A. Dewitt. 1981Soil Survey of Cerro Gordo County, Iowa. USDASCS.
Are T values correct?

A study of rates of mineral soil formation in 18 watersheds around the world (parent materials were glacial till, schist, granite, and other noncarbonate rock) concluded average rates of soil formation were closer to

**0.24 tons per acre per year, with a range of 0.01 to 0.8**

How much soil erosion occurs?
Conclusions (part 1)

- We are eroding soil faster than it is forming
- Soil erosion reduces crop yield
Erosion Trends in U.S.

Erosion on Cropland, 1982-2001

CRP Established
Where might kura clover fit?

- Bioeconomy
- Environmentally sensitive landscape positions – government program support
- Opportunity to maintain production + soil and water conservation