



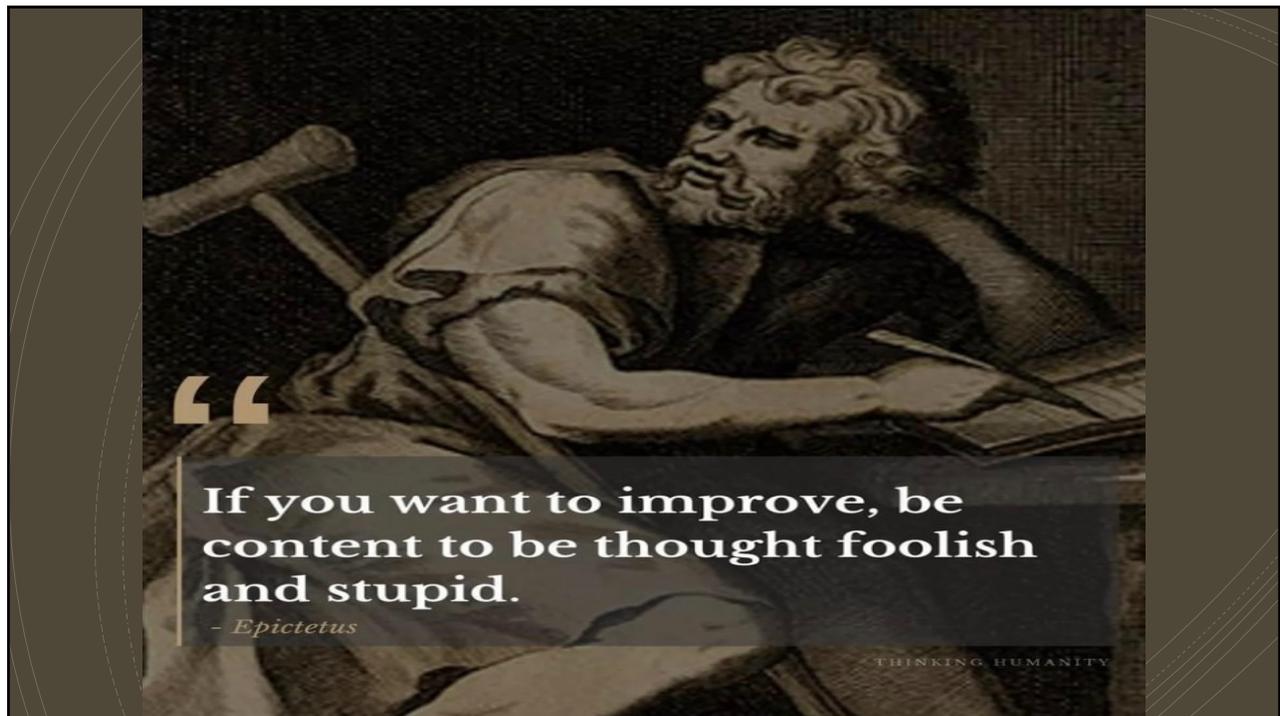
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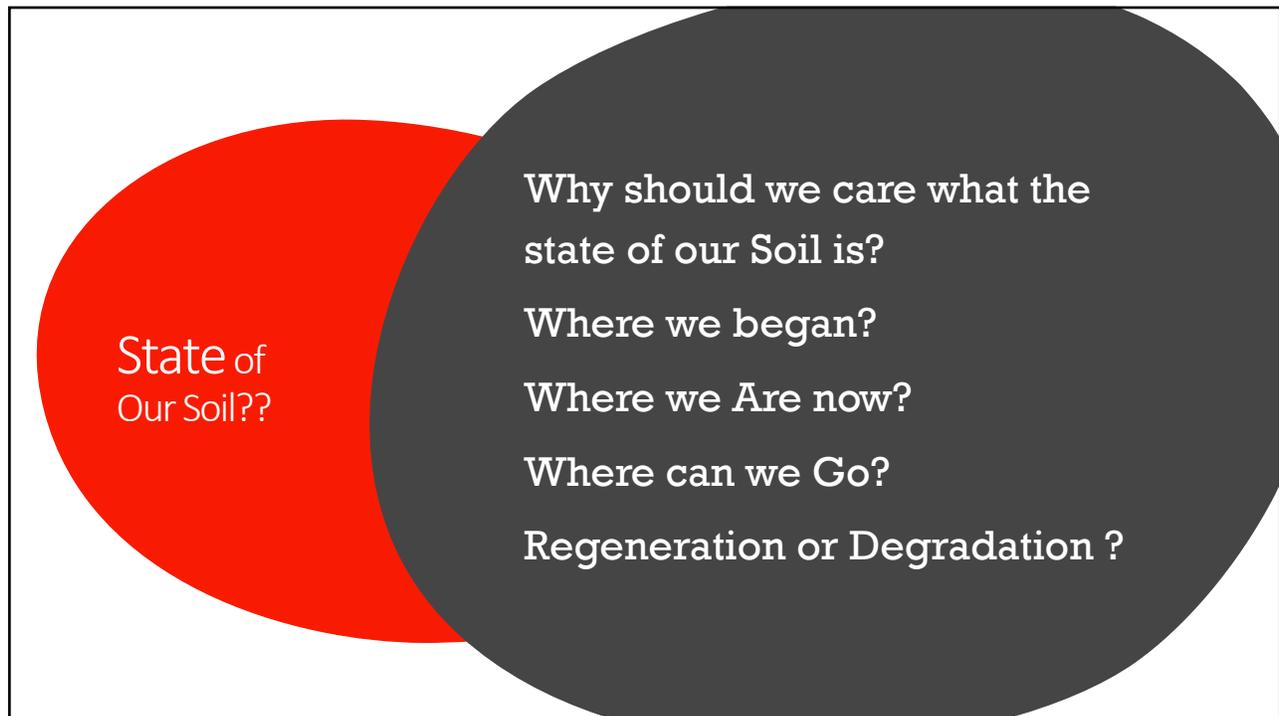
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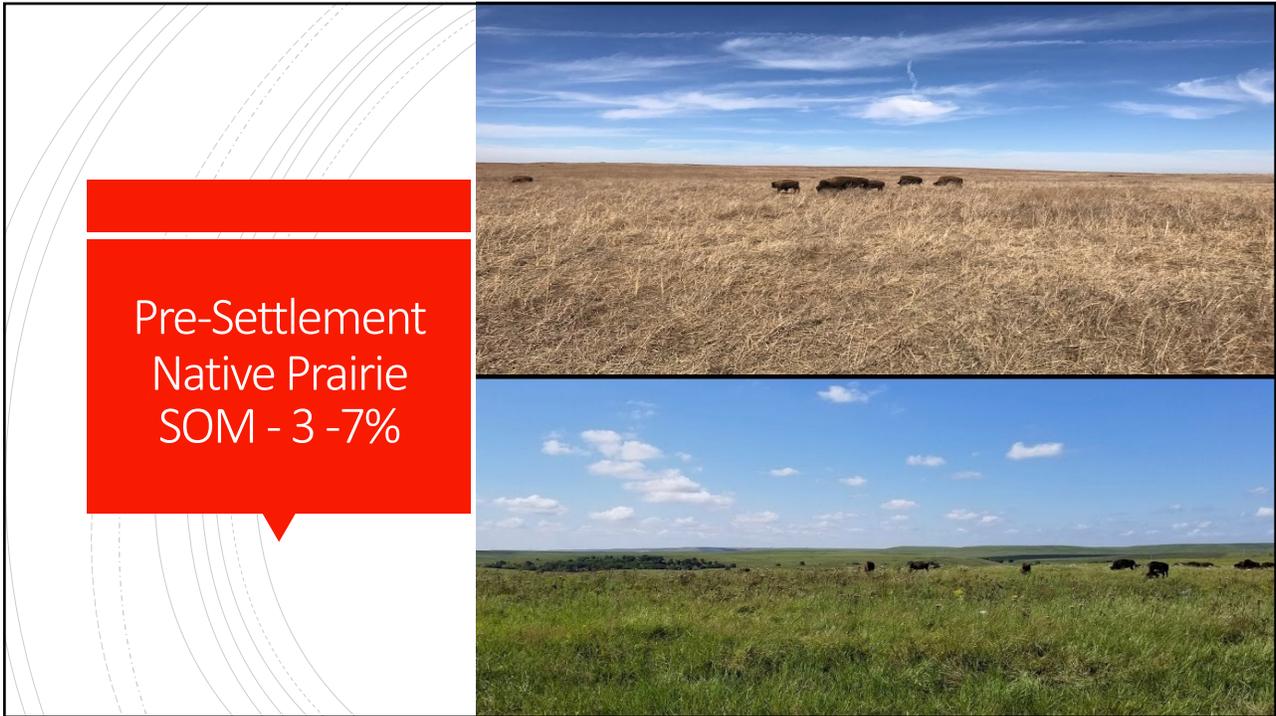
Principles of Soil Health

Mimic (Don't Fight) Nature

- Keep the soil surface covered
- Minimize soil disturbance and stress
- Increase plant diversity
- Maximize root growth
- Properly integrate livestock diversity



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A graphic with a white background and faint, curved lines. On the left, there is a red speech bubble with the text "Soil Erosion From Wind" in white. To the right of the speech bubble, there is a list item with a red square bullet point.

- On May 12, 1934 wind carried an estimated 200 million tons of soil from the southern plains to the Atlantic ocean.

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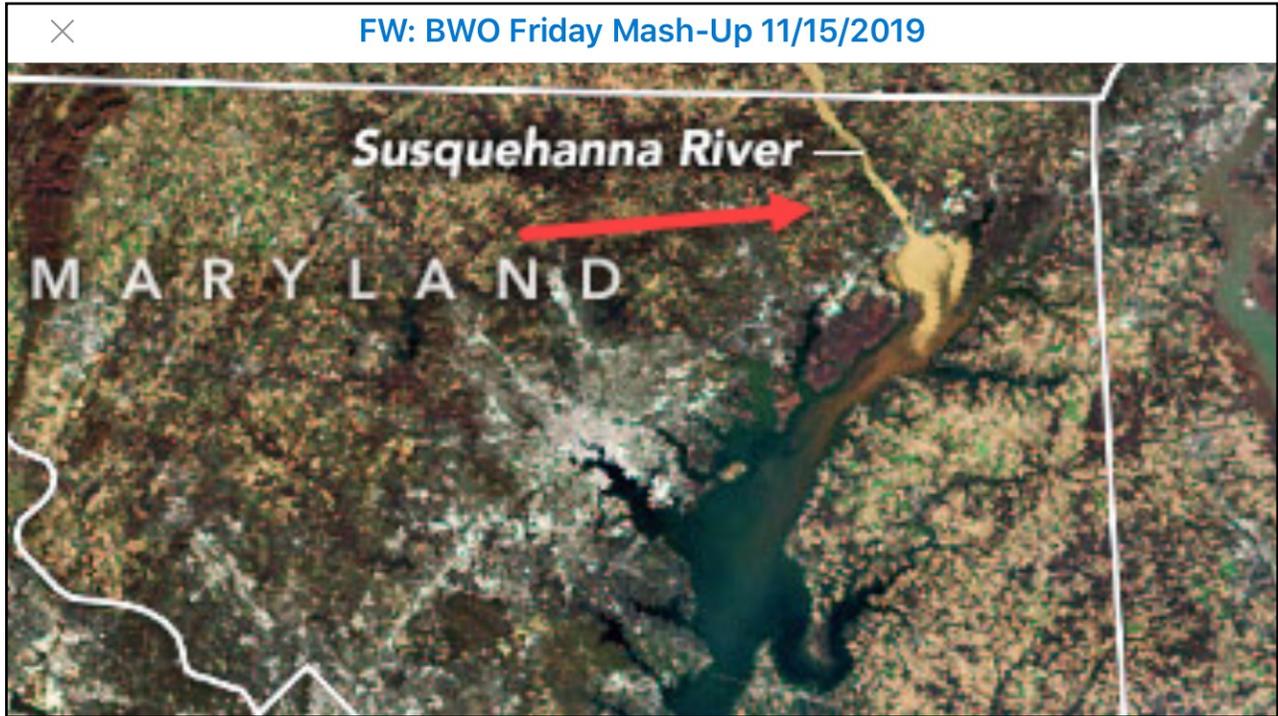
The bigger the Horse
Power got the faster
the Degradation was

GRANDDAD USED 1HP-25HP IN HIS
LIFETIME DAD USED 25 HP-160 HP
I USED 25 HP-380 HP IN MY LIFETIME

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On Halloween 2019 a series of
strong storms hit Pennsylvania. In a
few short hours, the Susquehanna
River was flowing Brown !!! Into the
Chesapeake Bay In Maryland.

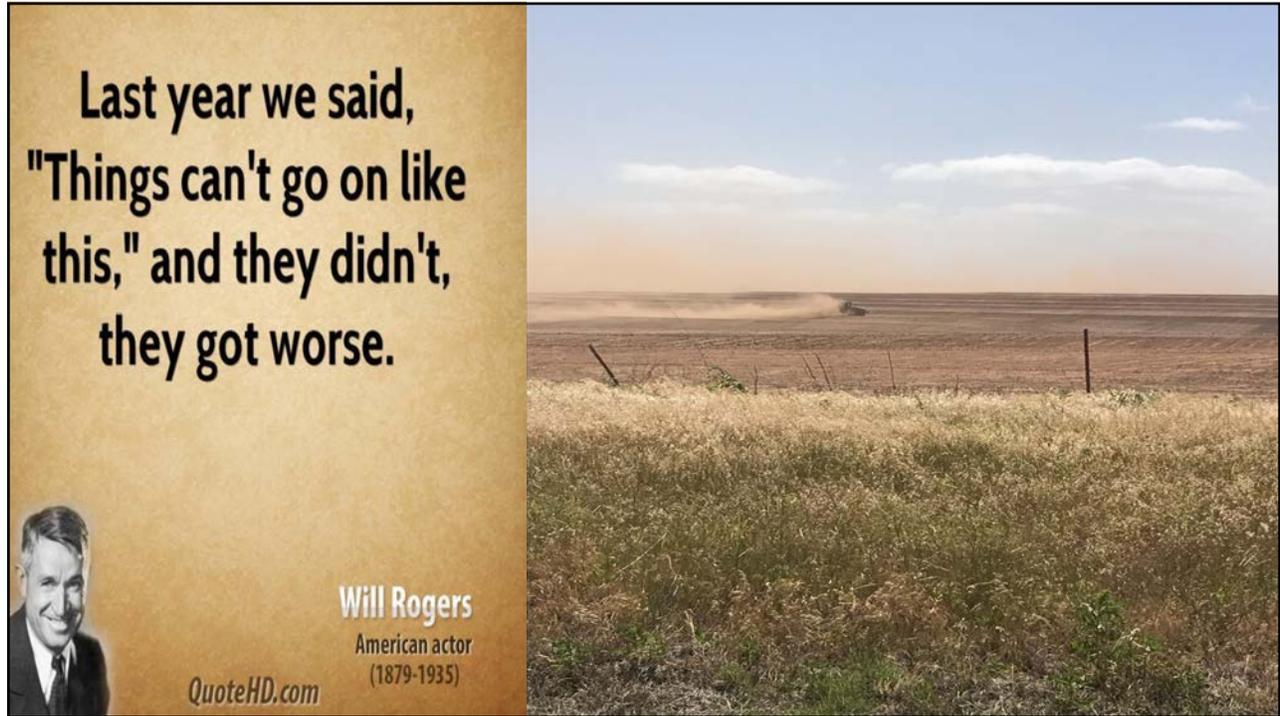
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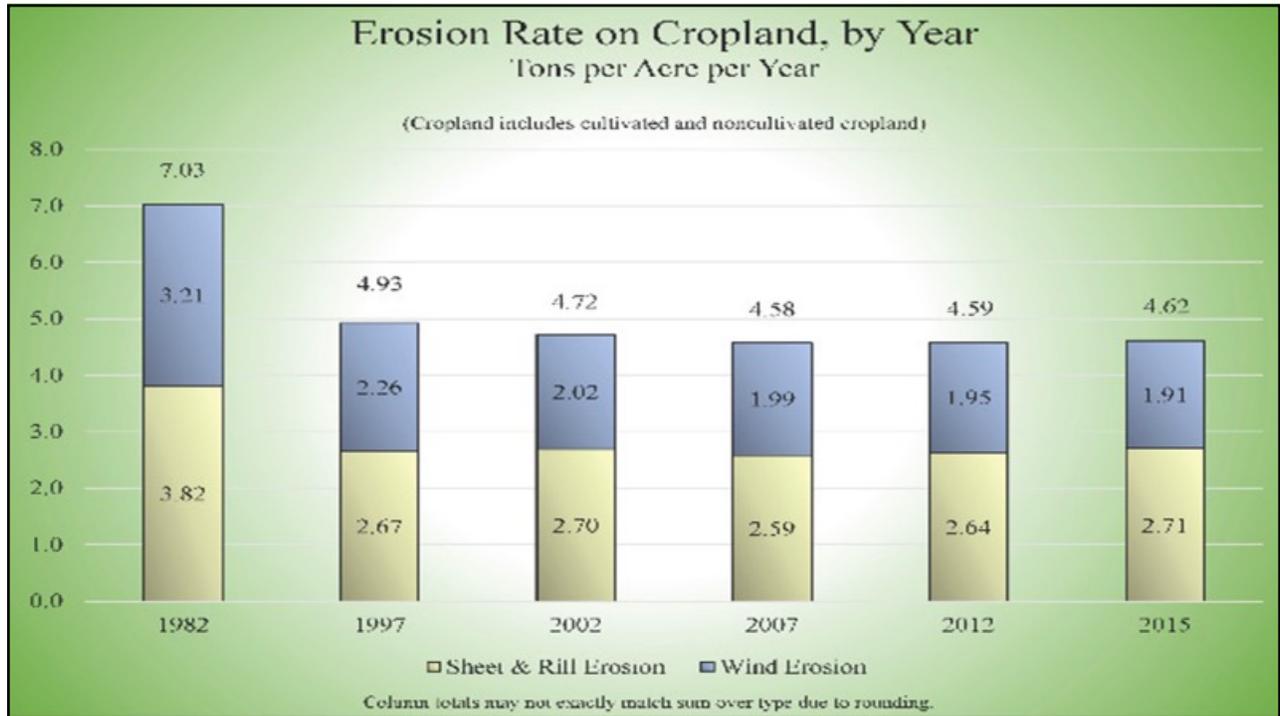
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“It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.” Charles Darwin

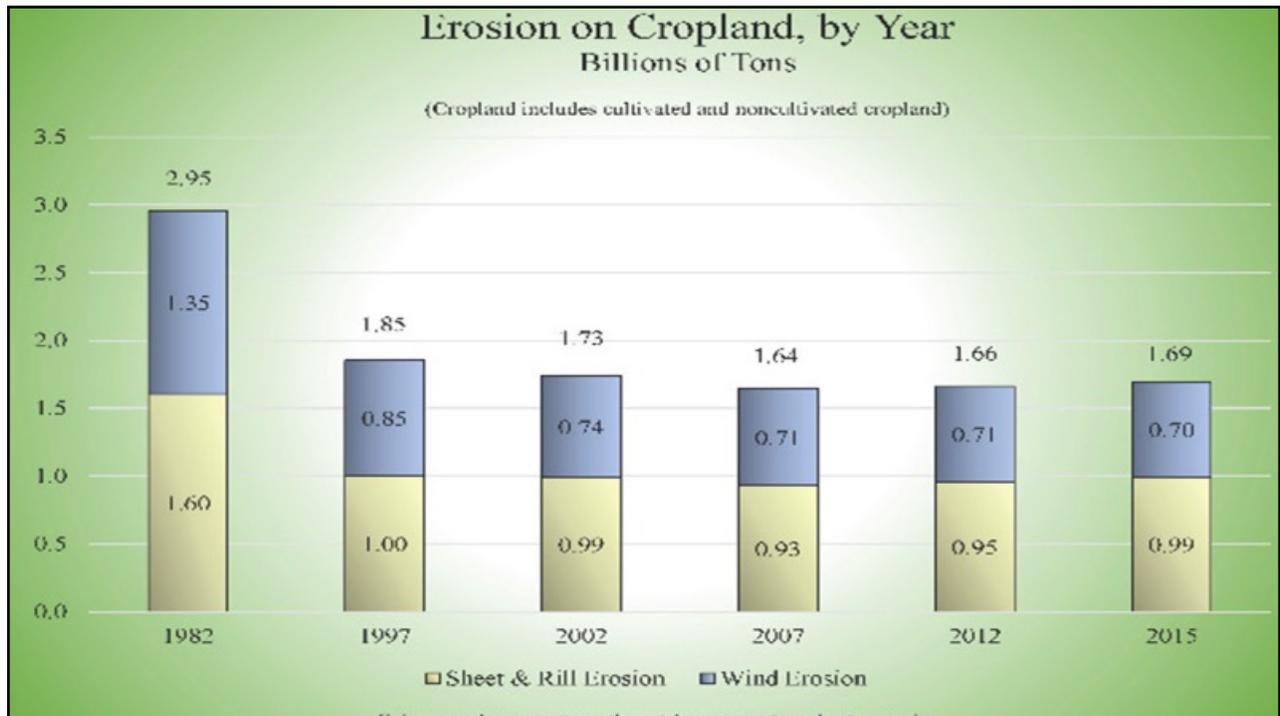
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Many Civilizations have come and gone from This Earth because they Did Not understand the SOIL!!! And they could Not feed themselves.

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33



34

- ▶ So 1,690,000,000 tons
- ▶ Divided by 2,000,000 lbs
- ▶ Per ac. Furrow slice is!!!!
- ▶ A Furrow Slice is the top 6.7"
- ▶ 1,690,000 ac furrow slices
- ▶ Is 70,416,666 semis at 80'
- ▶ 1,066,919 miles long convoy

35

- ▶ 1,690,000,000 Tons Divided by
- ▶ US Population of 329,000,000
- ▶ 5.1 Tons per Person in the US.

36

Why Should
Consumers Care
How Their Food is
Grown (HEALTHY)



37

Mineral depletion in meat 1940 - 1991

Average of 10 kinds of meat ...

- **Copper declined by 24%**
- **Calcium declined by 41%**
- **Iron declined by 54%**
- **Magnesium declined by 10%**
- **Potassium declined by 16%**

Ref: David Thomas 'A study on the mineral depletion of the foods available to us as a nation over the period 1940 to 1991'. Nutrition and Health 2003; 17: 85-115

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USDA data, 43 crops and vegetables 1950 - 1999

- Calcium **declined by 16%**
- Iron **declined by 15%**
- Riboflavin (Vit B2) **declined by 38%**
- Ascorbic acid **declined by 15%**
- Phosphorus **declined by 9%**
- Protein **declined by 6%**

Ref: Davis et al. 'Changes in USDA food composition data for 43 garden crops, 1950 to 1999'. Journal of American College of Nutrition 2004; 23: 669-682

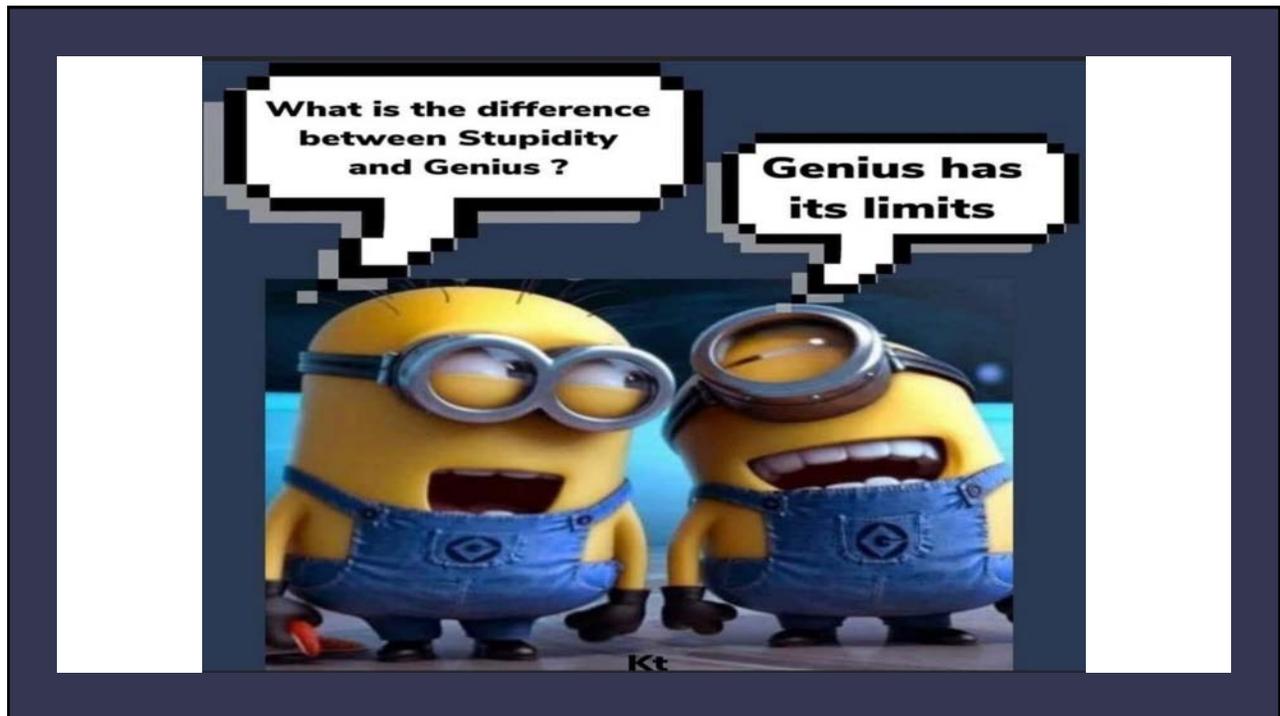
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No matter how
big a hammer
you use, you can't
pound common
sense into
stupid people.



JUST FOR JO
www.facebook.com

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**PLAYING THE LONG GAME IS
FOLLOWING THE ROAD LESS
TRAVELED BY TURNING DOWN
WHAT FEELS GOOD NOW IN
FAVOR OF WHAT WE THINK
WILL SET US UP FOR FEELING
AWESOME LATER ON.**

Sam Kyle

42

WHAT CAN WE DO

43

2017 Census of Agriculture

- ▶ Key Points
- ▶ 29% decrease in intensive Tillage
- ▶ 24% increase in farms using cover crops
- ▶ 51% increase in acres using cover crops

44



Drew Ewing
A Grad Student @
Clemson University

45

Soil Type Comparisons (Leedey, OK)



Upland with Rye? planted in residue of Grazed Cover Crop

Dark Brown (From memory: close to a Brunette Brown) for about the first 5 inches, with a marked change to a red clay below. Frost line based on ice crystals sat on the top ¼" of the soil, mainly on the surface. It held its structure, yet I was able to crumble the bottom 3" of the carbon-rich soil in my hands. (~10:25am, 1/2/2019)

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Conventionally managed field: Wheat?

Compacted red clay, characteristic of the region (don't have a Munsell chart for red clay color classification). It was tougher to get the sharpshooter shovel into the ground (took Mr. Emmons hoping on it with both legs), and the frost layer went about 5-6 inches down. The frost layer was inferred because when the shovelful was lifted out the bottom broke off at about 5-6 inches down and had ice crystals on its underside. The Red clay was frozen and difficult to break apart. It stuck to my hands once broken off- which was not observed in the first field- and froze my hands after a couple of minutes. (~10:40am, 1/2/2019)

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Bottoms planted in residue of Cover Crop

Shovel went in with little effort using mostly arms. Never reached a bottom without carbon-rich soil. Soil color, from memory, was close to an Umber brown. Ice crystals shallower than first field (top 1/8")— maybe being down below a hill helped reduce this. Was able to crumble the entire soil column in my hands with little effort and hands stayed somewhat warm during this. (~11:40am, 1/2/2019)

My visual observation.

Signed,

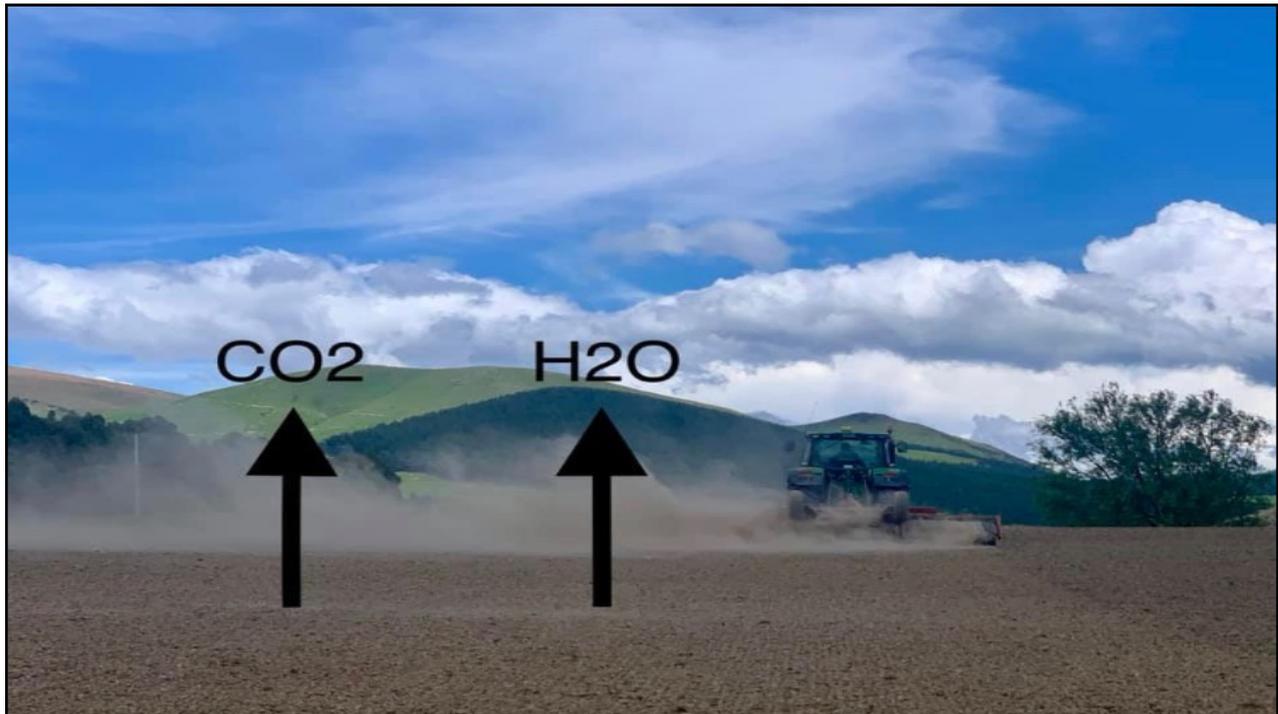
Drew Ewing

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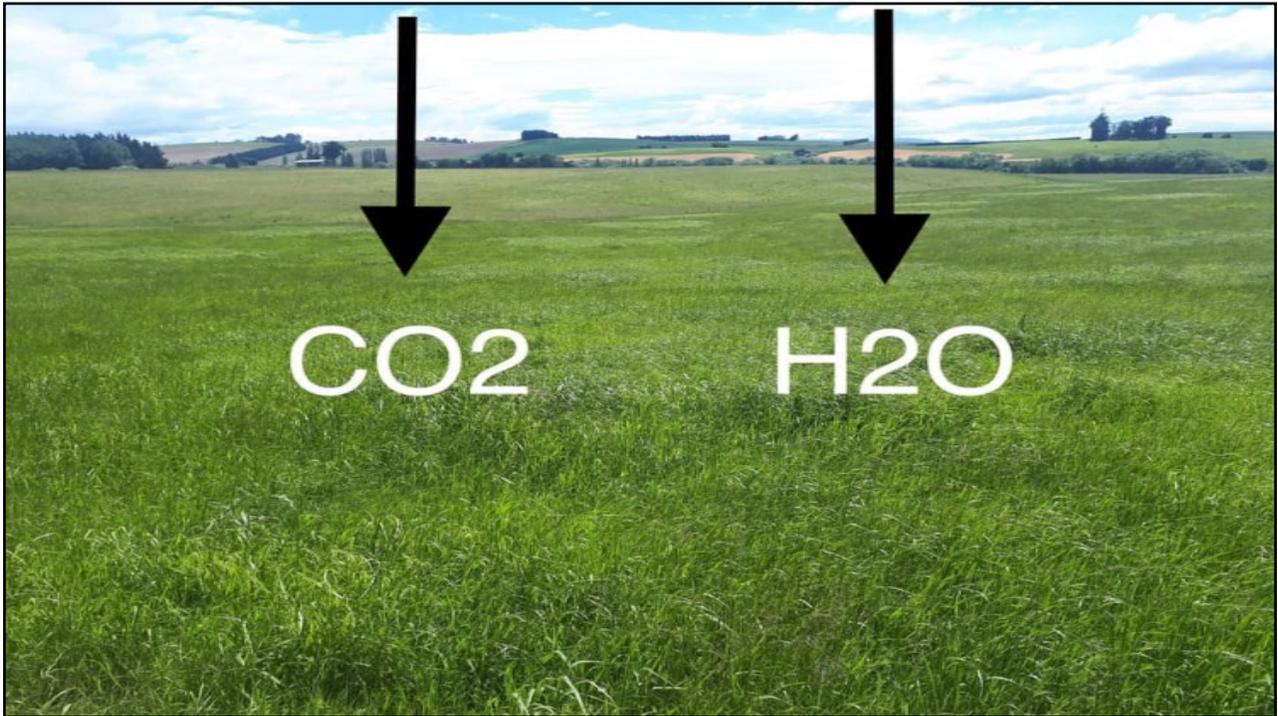
“ Consumers Should be
**Concerned
** Watching
** Caring ”

How we as Producers are Farming

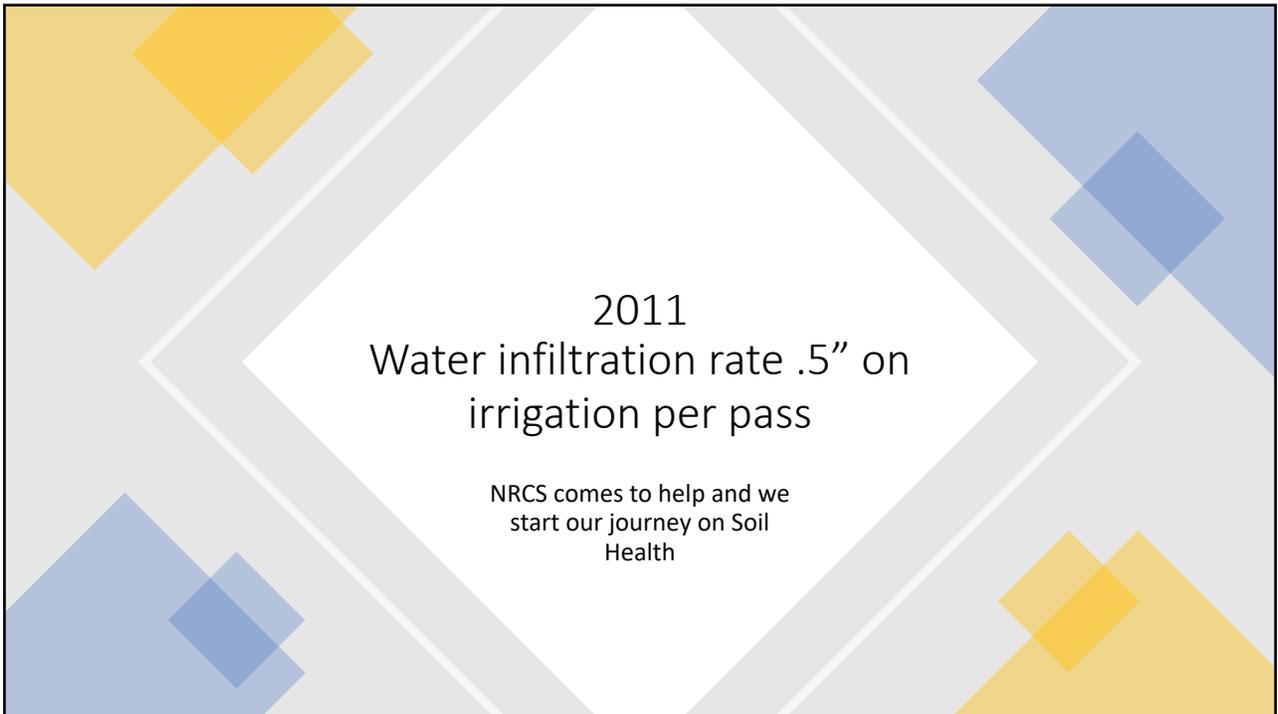
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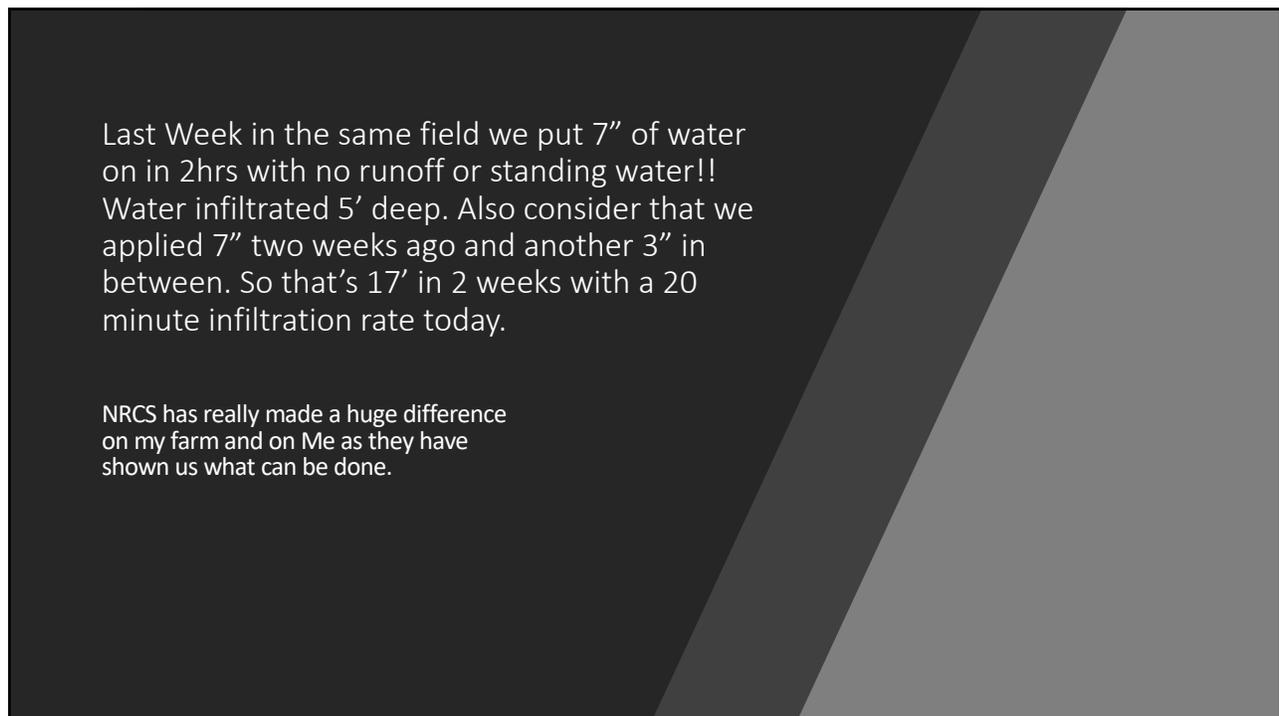
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The original soil survey mapped this soil as Ustifluent these were a very young soil and typically didn't have a very dark surface and this field didn't have that 8 years ago. "Said Steve Alspach NRCS state soil scientist for Oklahoma" today I see a dark soil we call Mollic so we can now reclassify it as a fluventic haplustoll.

Re-Classifying My Soil

59

There's more
to Pie than just
the crust!!!

- So how important is soil aggregation to soil health?
- It's everything beginning with improved infiltration, water holding capacity and carbon storage and more nutrients.
- If we get 8"-10" rainfall event and we can take it all in or at least most of it. That provides multiple benefits one is future water to grow crops with, more nutrients stay in the field instead of down stream. And our soil stays in place

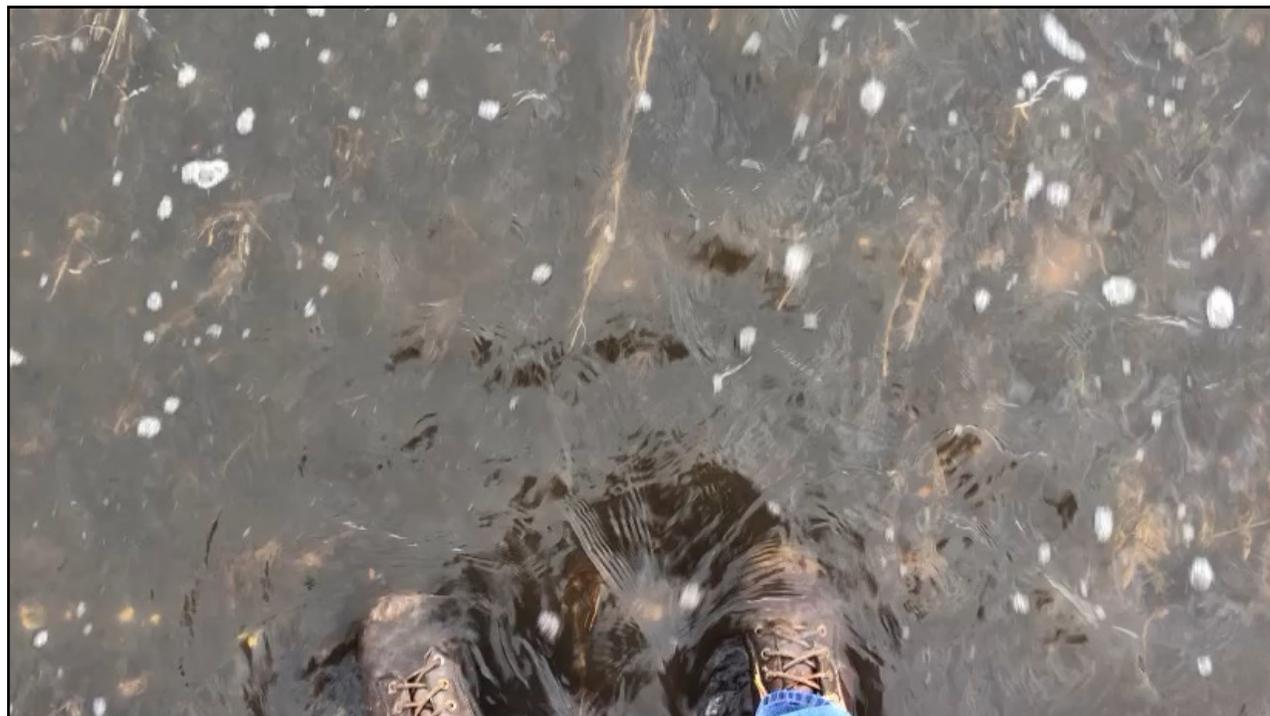
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Can we control runoff with Organic Matter?

- * 2% OM will hold 32,000 gallons of water or 21% of a moderate to Heavy rainfall.
- * 5% OM will hold 80,000 gallons of water or 53% of a Moderate to Heavy rainfall.
- * 8% OM will hold 128,000 gallons of water or 85% of a Moderate to Heavy rainfall.

“Dr. Allen Williams” 2016

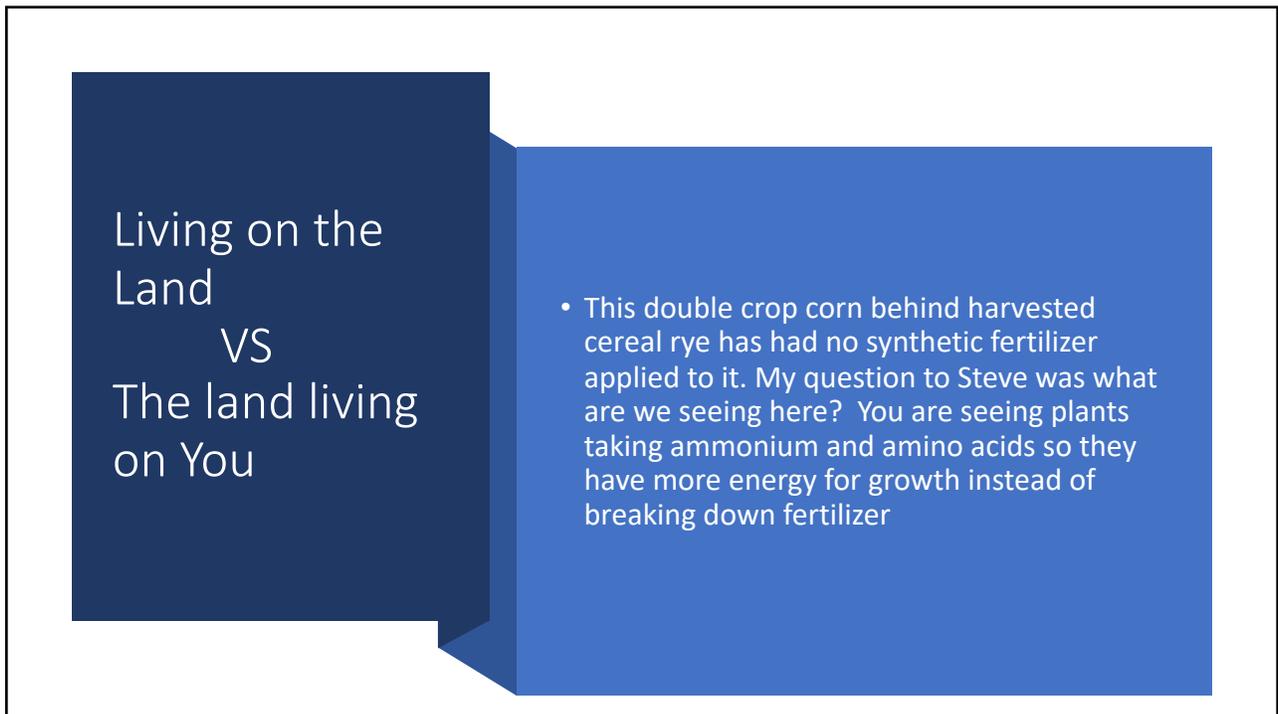
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A graphic design consisting of two main parts. On the left, a white background features faint, curved lines. A red speech bubble points downwards, containing the text 'The State of Our Soil Today (C-)'. On the right, a black rectangular area contains a quote in white, serif, all-caps font. At the bottom of the black area, the name 'MARTIN LUTHER KING JR.' is written in a smaller font, and the website 'MEDIWEBAPPS.COM' is at the very bottom.

The State of Our
Soil Today
(C-)

THE ULTIMATE
MEASURE OF A MAN
IS NOT WHERE HE
STANDS IN MOMENTS
OF COMFORT AND
CONVENIENCE, BUT
WHERE HE STANDS IN
TIMES OF CHALLENGE
AND CONTROVERSY.

MARTIN LUTHER KING JR.

MEDIWEBAPPS.COM

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SOIL STEWARDSHIP

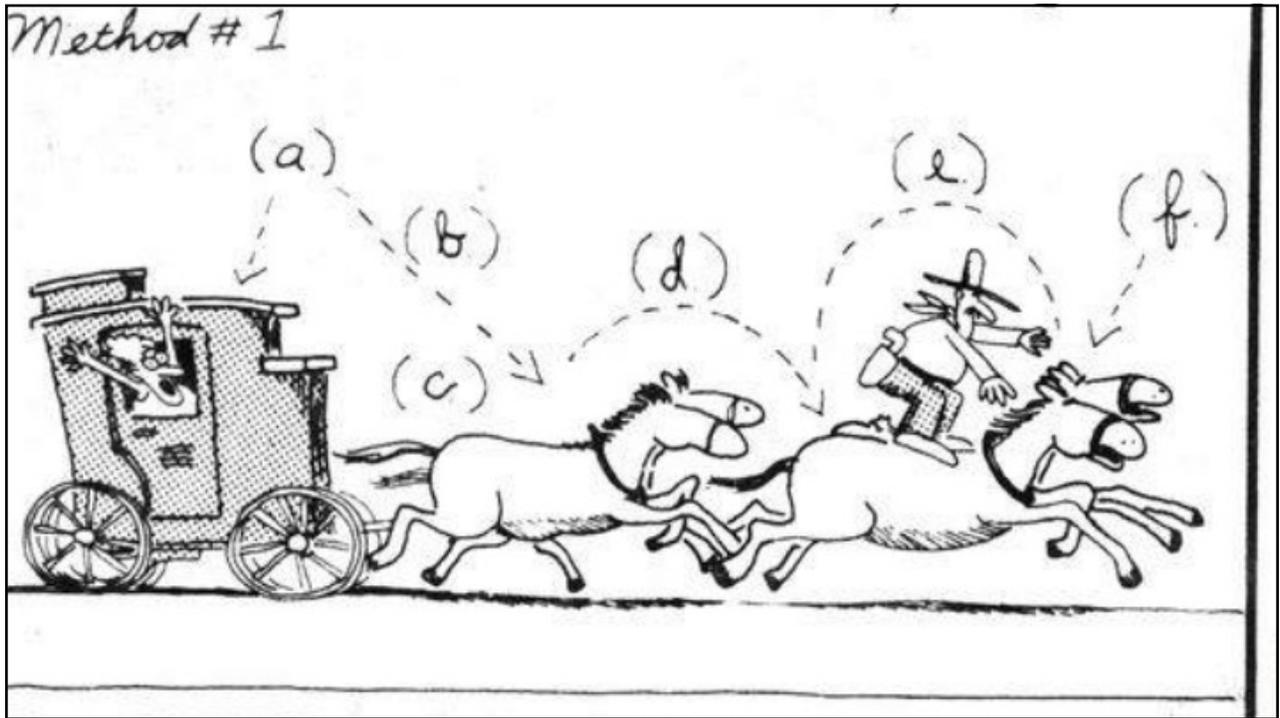
Soil stewardship and care must be embedded in every fruit and vegetable eaten, in each grain ground into the bread consumed, in every cup of water used, in every breath of air inhaled, and in every scenic landscape cherished.

Lal (2008)

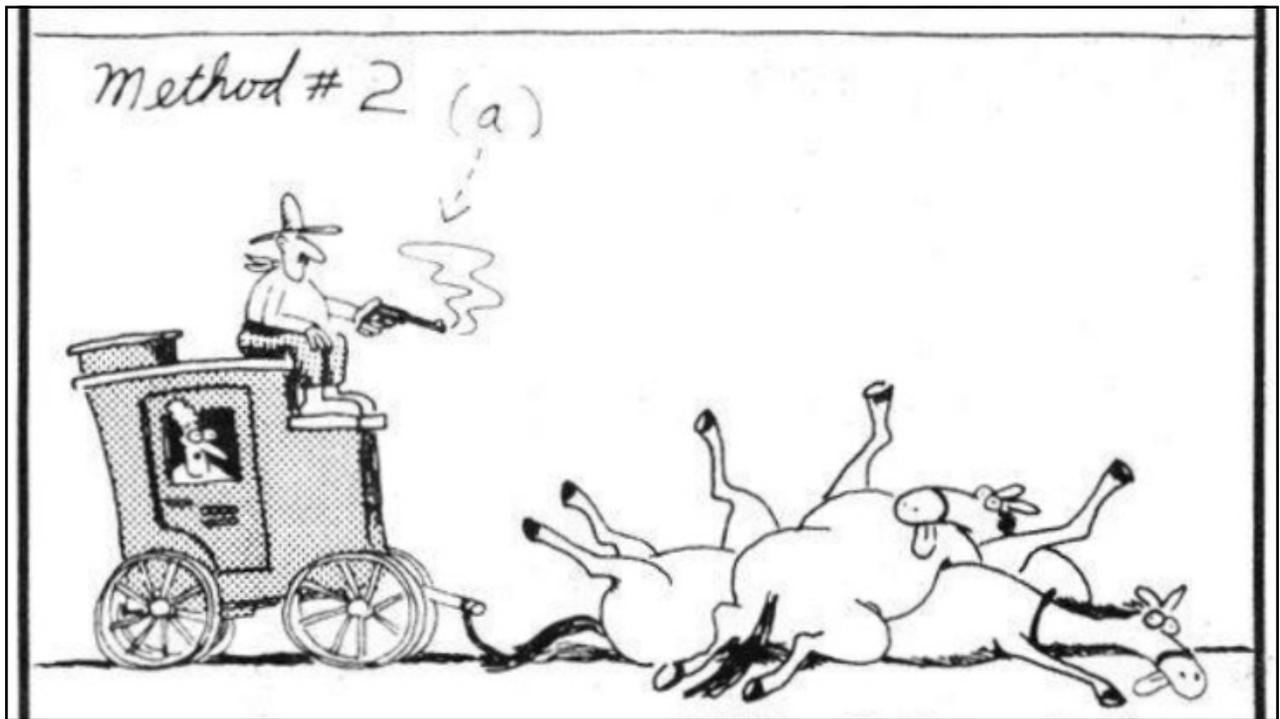
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How to stop a
Run away Stagecoach

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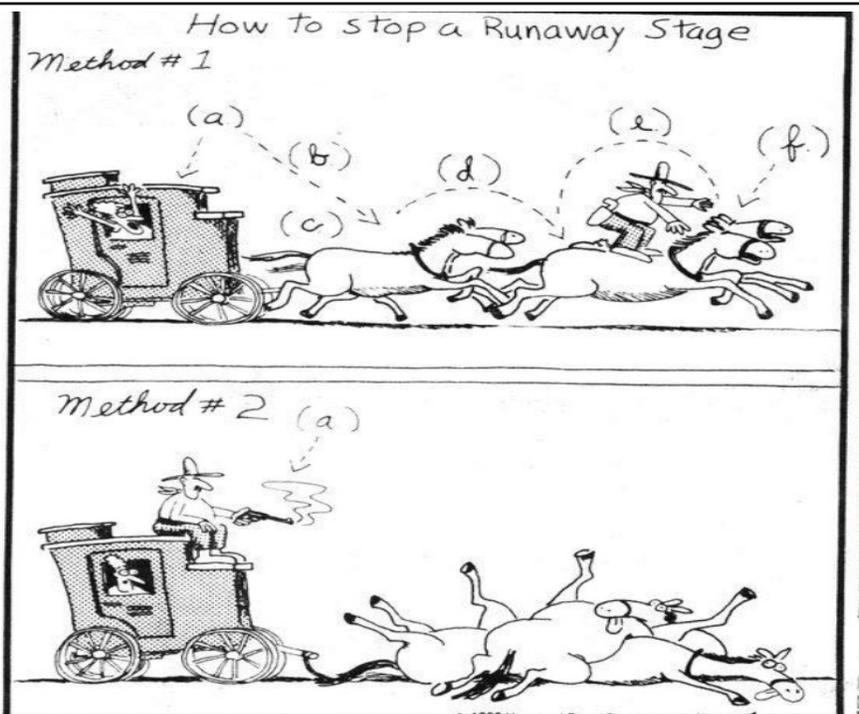


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Sometimes we are carrying the answer with us but just not looking in the right places to solve the problem.



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“Long Live the Soil”

JIMMY EMMONS

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Unlocking the secrets in the Soil

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