

unlock the  
**SECRETS**  
IN THE  
**SOIL**

Soil Health  
In  
Tennessee



Kevin Brown  
State Conservationist



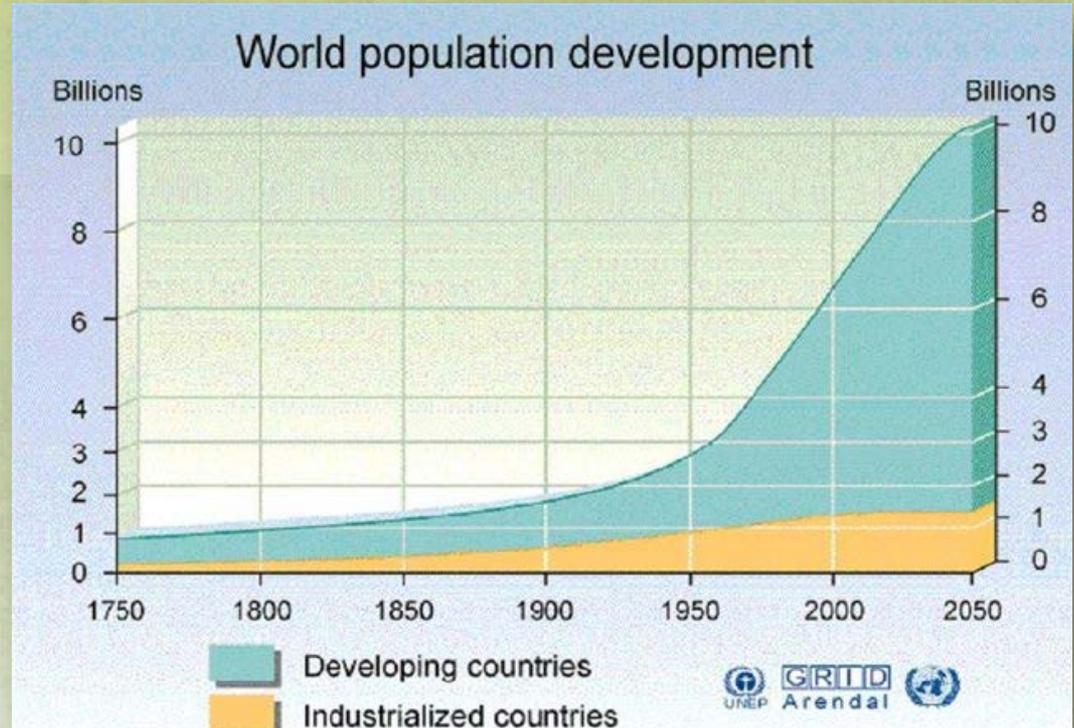
United States Department of Agriculture  
Natural Resources Conservation Service

United States Department of Agriculture is an equal opportunity provider and employer.

## Food for thought...

World population is estimated to reach 9.1 billion by 2050.

To sustain this level of growth, we will need to produce as much food in the **next 40 years** as we have in the **past 500 years**.



## Food for thought...

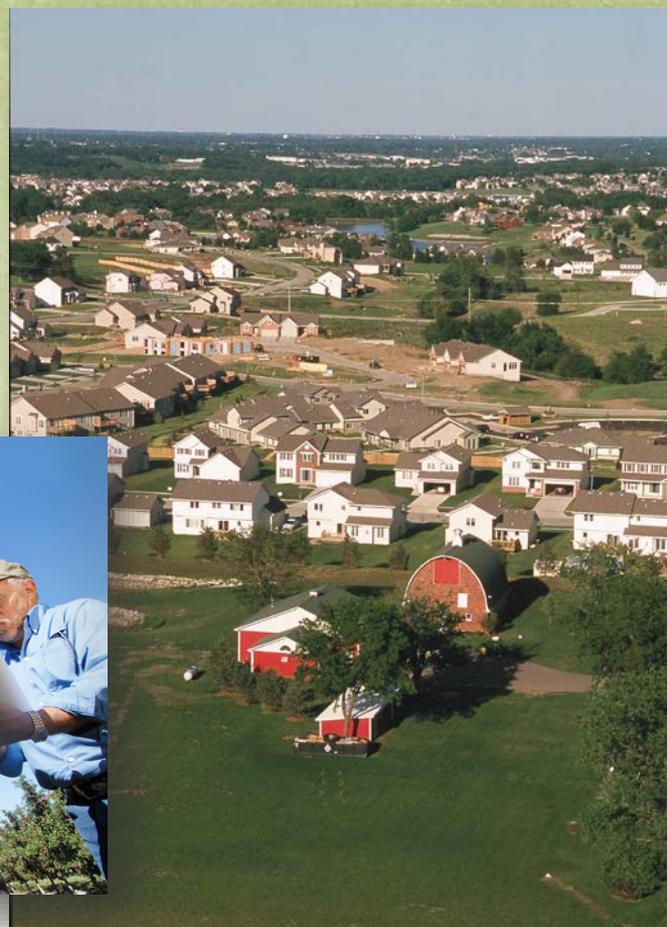
### Need to optimize inputs

Producers are searching for ways to optimize inputs and maximize profits.



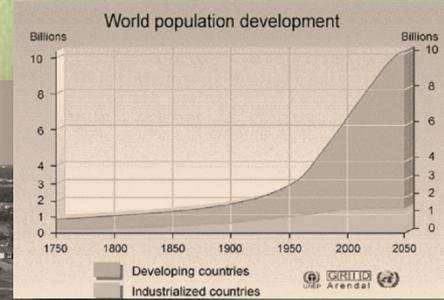
## The Changing Landscape of Conservation Assistance

The nation is facing expanding and conflicting environmental, land use, and food production priorities.





# Addressing the issues...



## Benefits of healthy soils

- ✓ Improve water quality
- ✓ Regulate water and reduce flooding
- ✓ Cycle organic wastes and detoxify noxious chemicals



## Soil Health Benefits *(continued)*

- ✓ Increase soil carbon and remove CO<sub>2</sub>
- ✓ Save energy
- ✓ Save water and increase drought tolerance



## Soil Health Benefits *(continued)*

- ✓ Improve income sustainability
- ✓ Improve plant health; and
- ✓ Increase nutrient-rich food production



## Soil Health Benefits *(continued)*

- ✓ Improve wildlife habitat and estuarian food production
- ✓ Reduce disease and pest problems



## Watershed Level Benefits

- ✓ Reductions in sediment and nutrient delivery to surface waters decreases potential for downstream hypoxic zone formation
- ✓ Increased infiltration and water holding capacity.



## A landscape example...

By **increasing the water absorption** of all of the cropland in the Mississippi River Basin by just **one-half inch** (through improved soil quality), that water retention would be the equivalent of...



## A landscape example...

The amount of water that flows over Niagara Falls in 83 days.





# Producer Benefits

- Gabe Brown has maximized his inputs, increased profits and has reduced his pesticide application by half.





# Benton County

## *Parker Farms*

Cover of Cereal Rye, Radish and Clover



# Cannon County Early Daikon Radish



# Carroll County

## *Brad Cochran Farm*

### Cover of Rye and Forage Radish



**Crockett County**  
***Steve Bailey Farm***  
**Early Daikon Radish**



# Dyer County

## *Malcolm Burchfiel Farm*



Cover of Cereal Rye and Forage Turnip Following Corn



# Fayette County

## *Jesse Hall Farm*



Newly Emerging Cover Cop Flown on Just After Harvest



# Gibson County

## *Wayne Bates Farm*



Cover of Rye, Oats, Turnips, Crimson Cover & Winter Pea



# Hardeman County

## *Jesse Hall Farm*

Cover of Cereal Rye and Crimson Clover Sown Post Harvest



# Hardin County

## *Karl Forshbach*



Sun Hemp Planted on flooded soybean acreage  
adds nitrogen for future wheat crop



2013/09/24

# Hardin County

## *Ricky Essary*

Part of 5 year Cover Crop Study

*Note: Tracks reduce compaction*



# Hardin County *Rick Essary Farm*



“Discover the Cover” – Counting Earthworms



# Haywood County

## *T&B Farms*

### Multispecies Cover Crop in Cotton



# Henderson County

## *Ricky Blankenship Farm*

Mix flown on at end of September, photo taken last week of October





# Henry County *Brewer Farms*

Cereal Rye, Forage Radish Flown on Following no-Till Corn



# Henry County

## *Near Jones Mill, TN*



Broadcast Cover of Cereal Rye, Forage Radish



# Lauderdale County *Peyton Mathis Farms*

“We are happy about our soil being covered and looking so green.”



# Lauderdale County *Ungerecht Farms*



Aerial in  
Standing  
Soybeans

# Macon County

Grass Roots from Pasture with Good Soil Health



# Madison County

## *Johnny Verell Farm*

### Multispecies Winter Cover Crop



# Madison County Johnny Verrell Farm



Continuous Corn with Soil Health Mix applied by Broadcast



# Marshall County

Hay Producer, Mike Collins, lets low yield cuttings return to the ground for better soil health.



# Maury County *Bret Herrmann*

## Drilling Soybeans Into Cover Crop



# Maury County

## *Daryl Brown Farm*



Cover Crop Mixture of Radish, Wheat & Crimson Clover



# McNairy County

## *Ricky Essary Farms*



Mixture of Clover, Cereal Rye, Oats and Tillage Radish



**McNairy County - Ricky Essary Farms**  
**Mixture: Clover, Cereal Rye, Oats and Tillage Radish**

# McNairy County

## *Ricky Essary Farms*



No-Tilled Soybeans Into Chemically Killed Winter Cover Crop



# Obion County Ricky Seals Farms



Cereal Rye and Tillage Radish Following Corn



# Sumner County *Cummings Farm* Broadcast Seeded



# Sumner County

## *Russell McGlothlin Farm*

### Cover in Soybeans



# Weakley County *Yarbro Farms*



Cereal Rye No-Tilled Drilled into Corn Stalks



# Williamson County *Todd Thomas Farm*



Five Species Mix Planted 10/11; Photo taken 10/28



# Soil Health Works for Everyone!!!



# 4 Keys to Improving Soil Health

- Reduce disturbance and erosion
- Cover: Green canopy and/or Brown residue
- Living Roots
- Diversity





TOTAL VIDEO CONVERTER  
[HTTP://EFFECTMATRIX.COM/](http://effectmatrix.com/)





# Resources

- NRCS EQIP: [www.tn.nrcs.usda.gov/programs](http://www.tn.nrcs.usda.gov/programs)
- Google search “Ray the Soil Guy”
- Cover Crop and Soils manual – SARE17:  
<http://www.sare.org/>
- SmartMix Calculator:  
<http://www.greencoverseed.com/>