



Principles of Soil Health

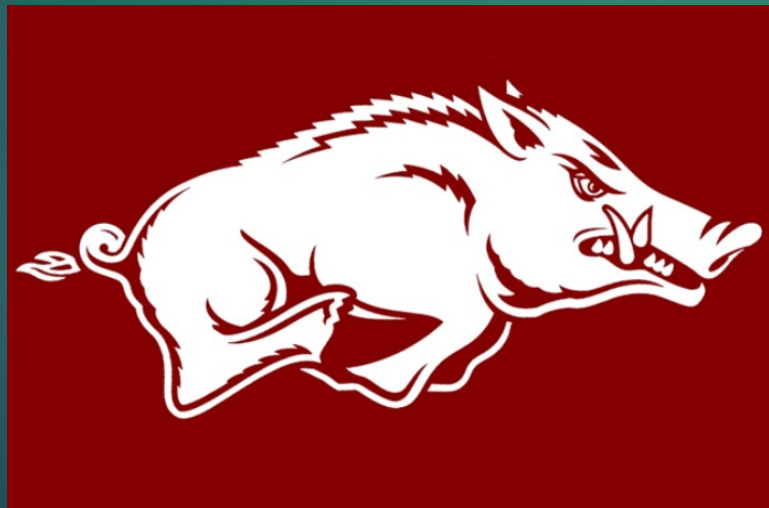
POTENTIAL HAZARDS ALONG THE WAY



- We are fourth generation farmers
- We started farming with dad in 2006
- Farm around 7500 acres at Cotton Plant AR with my brother Seth
- Started experimenting with covers 2010
- Our yields are competitive for our area
- Make the crop 50%-60% of \$ than before



Arkansas State University
Graduated 2002
B.S. Botany



University of Arkansas
Graduated 2005
M.S. Entomology



What changes do we need to make?

- No Tillage unless necessary
- Keep the Soil Covered at all Times!
- Keep a Living Plant/Root 365 days a Year
- Allow for as much Diversity as Possible
- Integrate Livestock



Tillage is destructive to soil and must be used sparingly. Essentially as a last resort for field repair.

Top soil loss from wind and rain are not only detrimental to the environment but your bottom line. It is completely preventable.



Armor the Soil



How do we armor soil

- ▶ Eliminate or greatly reduce tillage to maintain existing residue.
- ▶ Plant cover crops and roll down to make a mulch layer.
- ▶ This layer of cover crops also provides beneficial habitat to insects, birds, and other animals that forage on weed seeds.
- ▶ Other things to consider are more diverse rotations of crops and cover crops to further exploit the opportunistic nature of pests.

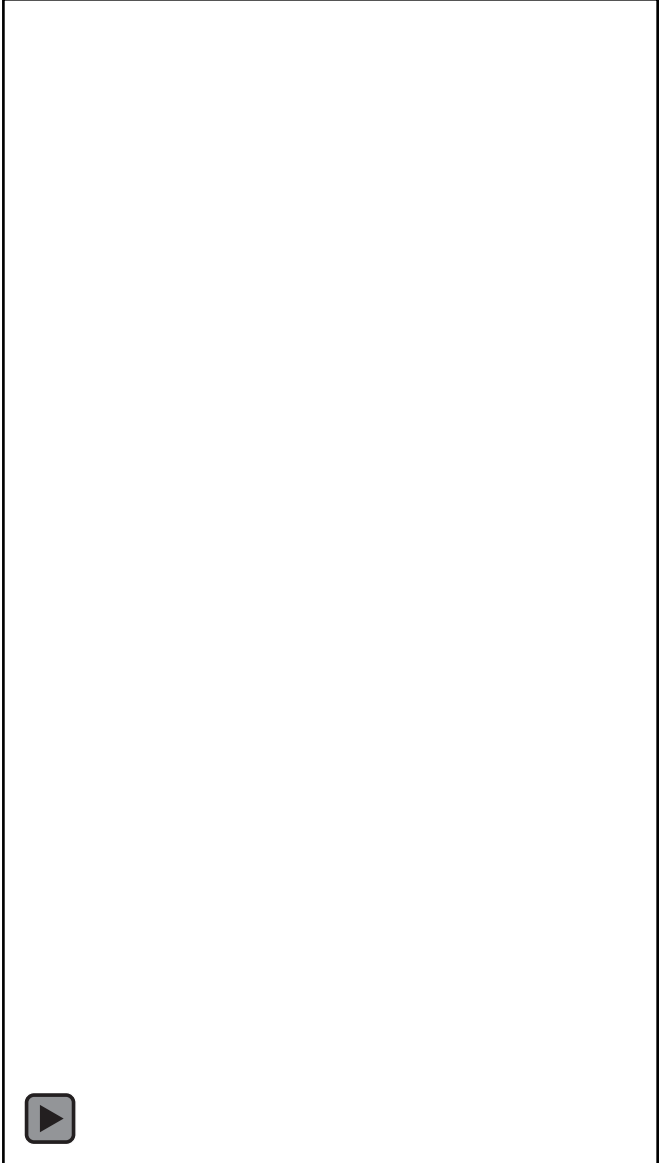


Armor the Soil



Have a plan when choosing your armor!

- ▶ What is the next crop?
- ▶ How does the armor I'm choosing fit my goals?
- ▶ Am I getting quality seed?
- ▶ How will I terminate and plant into this?



Modifications
are often
needed

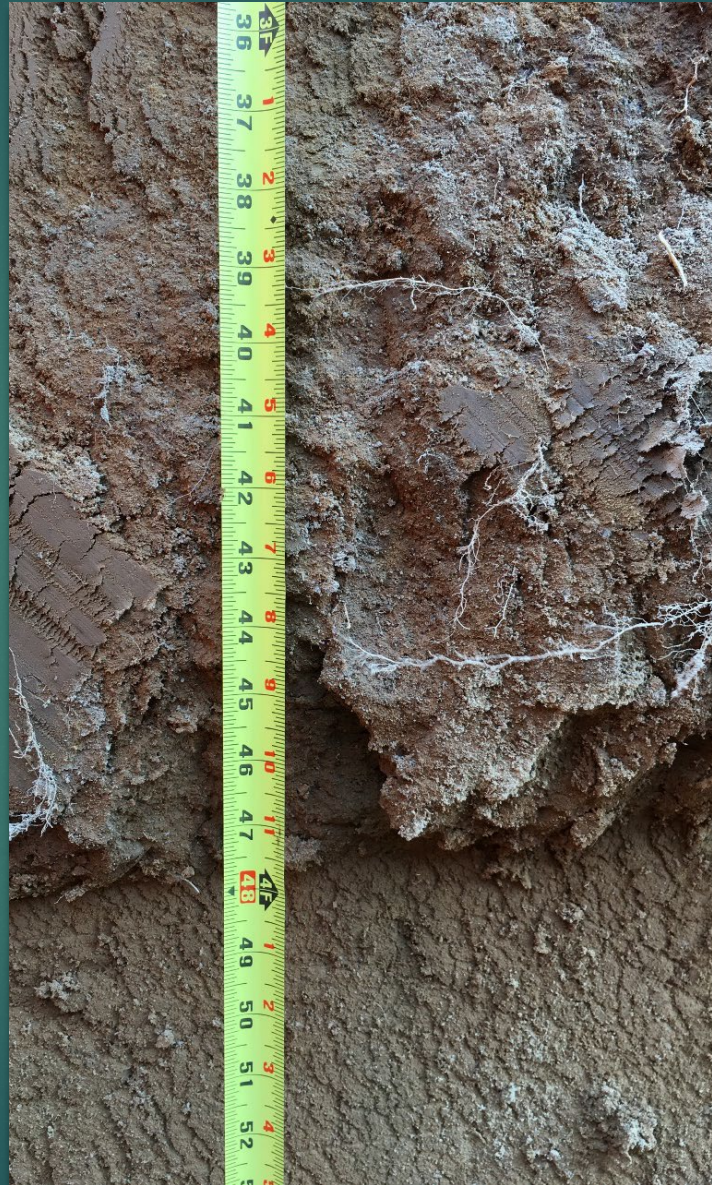




Diversity of living Roots

Roots FIX SOIL

- ▶ More roots equals more access to nutrients and water
- ▶ Larger roots give more opportunity for rhizobia colonization and mycorrhizal associations
- ▶ This adds up to less fertility and irrigation required



LIFE IN THE SOIL

DIVERSITY IS NOT JUST LIMITED TO PLANTS

- ▶ Earthworms
 - ▶ Will become abundant if soil is left undisturbed
 - ▶ Need constant supply of plant residues to thrive
 - ▶ One million earthworms (about 25 worms per cubic foot) can digest 36 tons of soil in a year
 - ▶ The castings from that digestion contain 4-30-73 NPK per ton along with large quantities of micronutrients
 - ▶ The effects from their burrowing can increase water infiltration rates 60-fold



Livestock Integration

- ▶ Fencing
- ▶ Water
- ▶ Market





Change is difficult. Don't Panic, just breath and think

Just because it has always been done that way doesn't mean that's the only way to do it.

Change your mindset and forget what you "know".

Learn with a clear head and open eyes.