

Back Yard Cover Crops and Soil Secrets

Building, Increasing and Holding Fertility

www.homefoodsystems.com

Introduction to the Concept & Soil Functions

- What is a cover crop
- How Long Have Humans Used Cover Crops
 - Washington and Jefferson lamented they were under used
 - Records in China and India go back 1000s of years
 - Before chem ag you either covered or you moved
- Why do we use cultivated species for covers vs. weeds/wild plants
- What is cover crop termination
- What is “planting green”
- Where does cover cropping work



Matching Benefits with Context & Goals

Some Benefits of Cover Crops

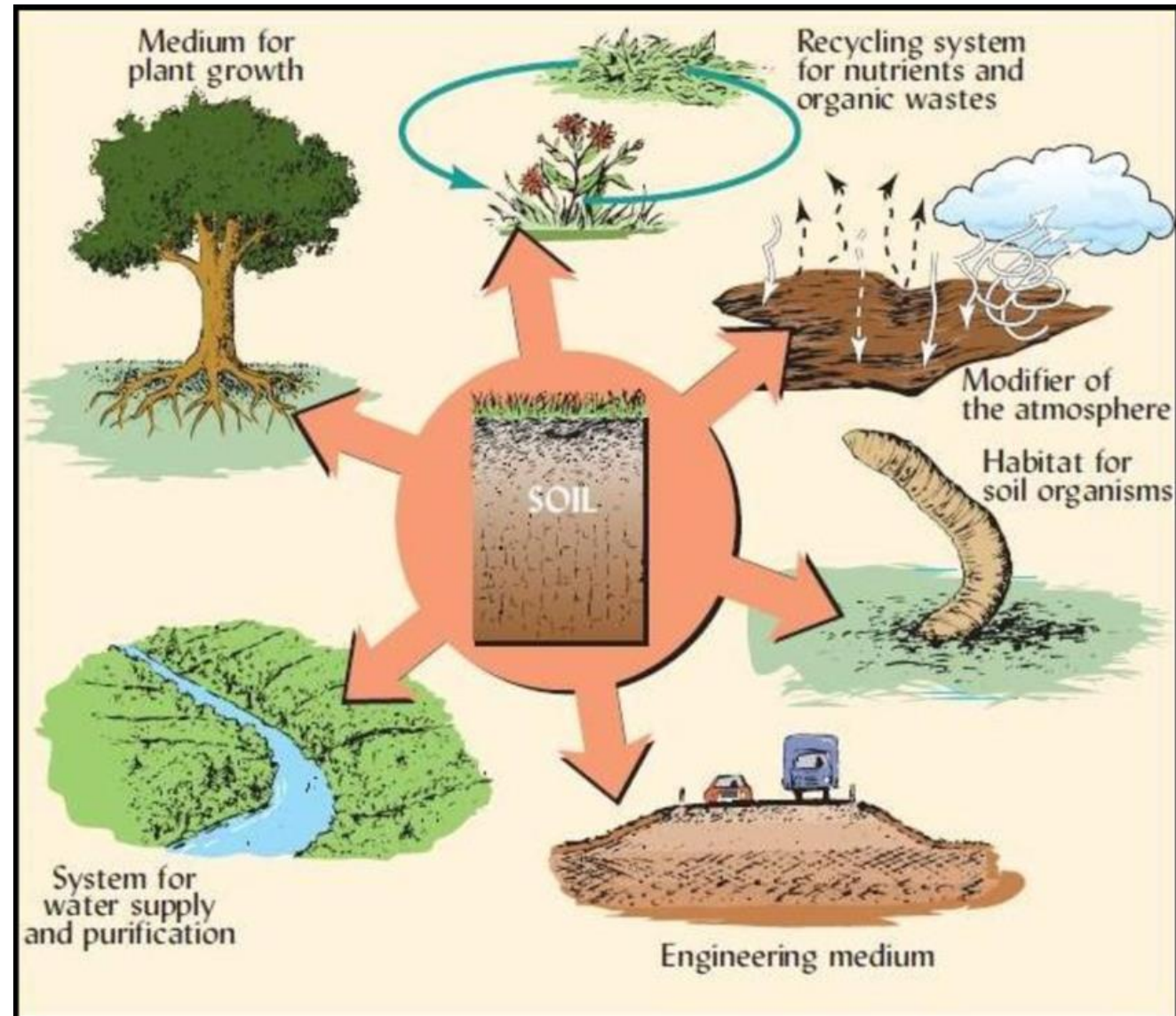
- Increase Soil Organic Matter
- Increase Biological Activity
- Infiltration, Percolation & Retention of Water
- Prevention of Erosion
- Attracts Pollinators & Predators
- Eliminates or Reduces Inputs – (toxic and expensive)
- Weed Suppression
- Increase Biodiversity
- Temperature Regulation
- Phytoremediation



Introduction to the Concept & Soil Functions

- The Six Functions of Soil

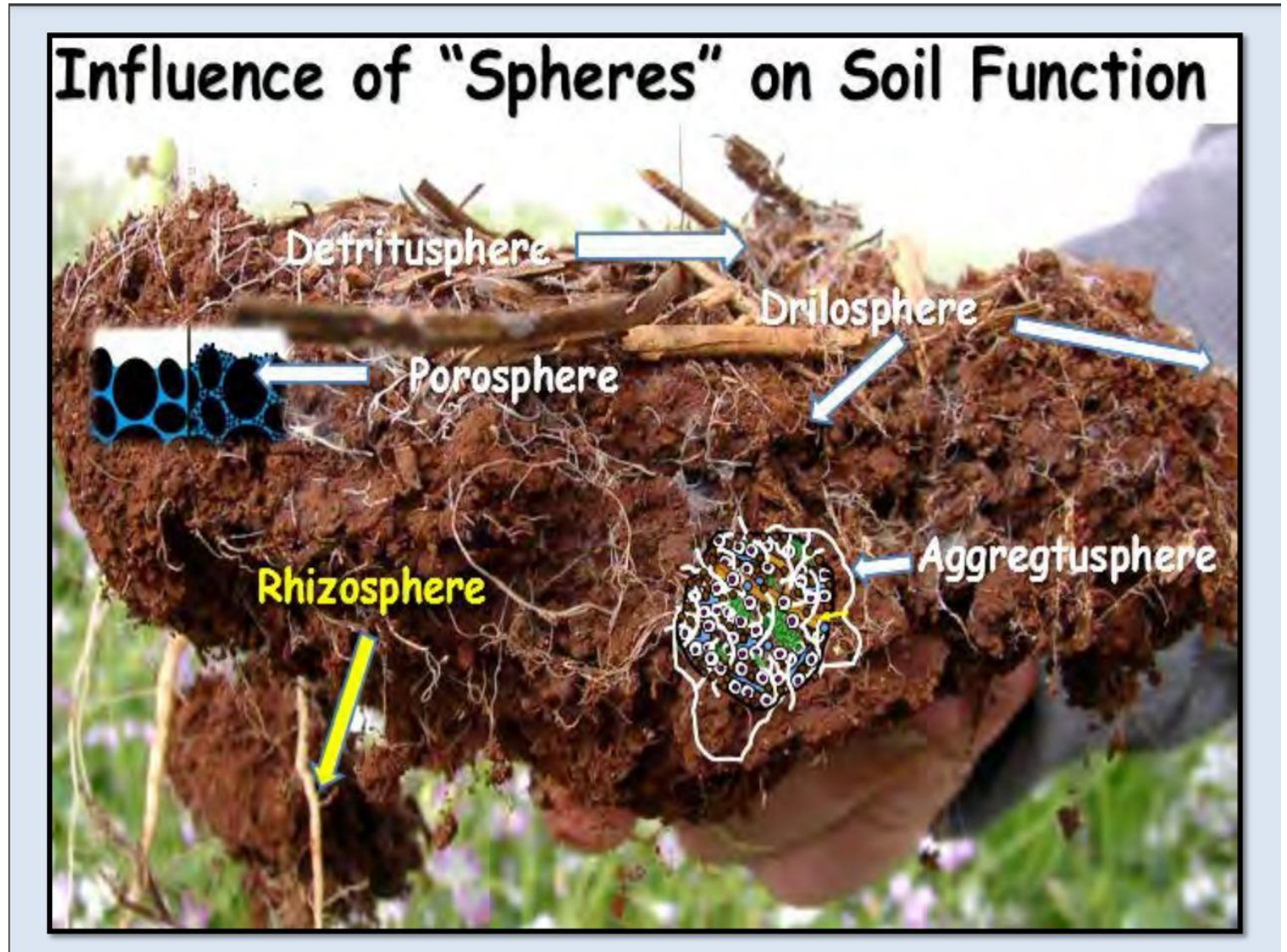
- Growth Medium
- Habitat for Soil Organisms
- Supply and purify water
- Engineering Medium
- Recycle Nutrients and Organic Matter
- Atmosphere Modifier



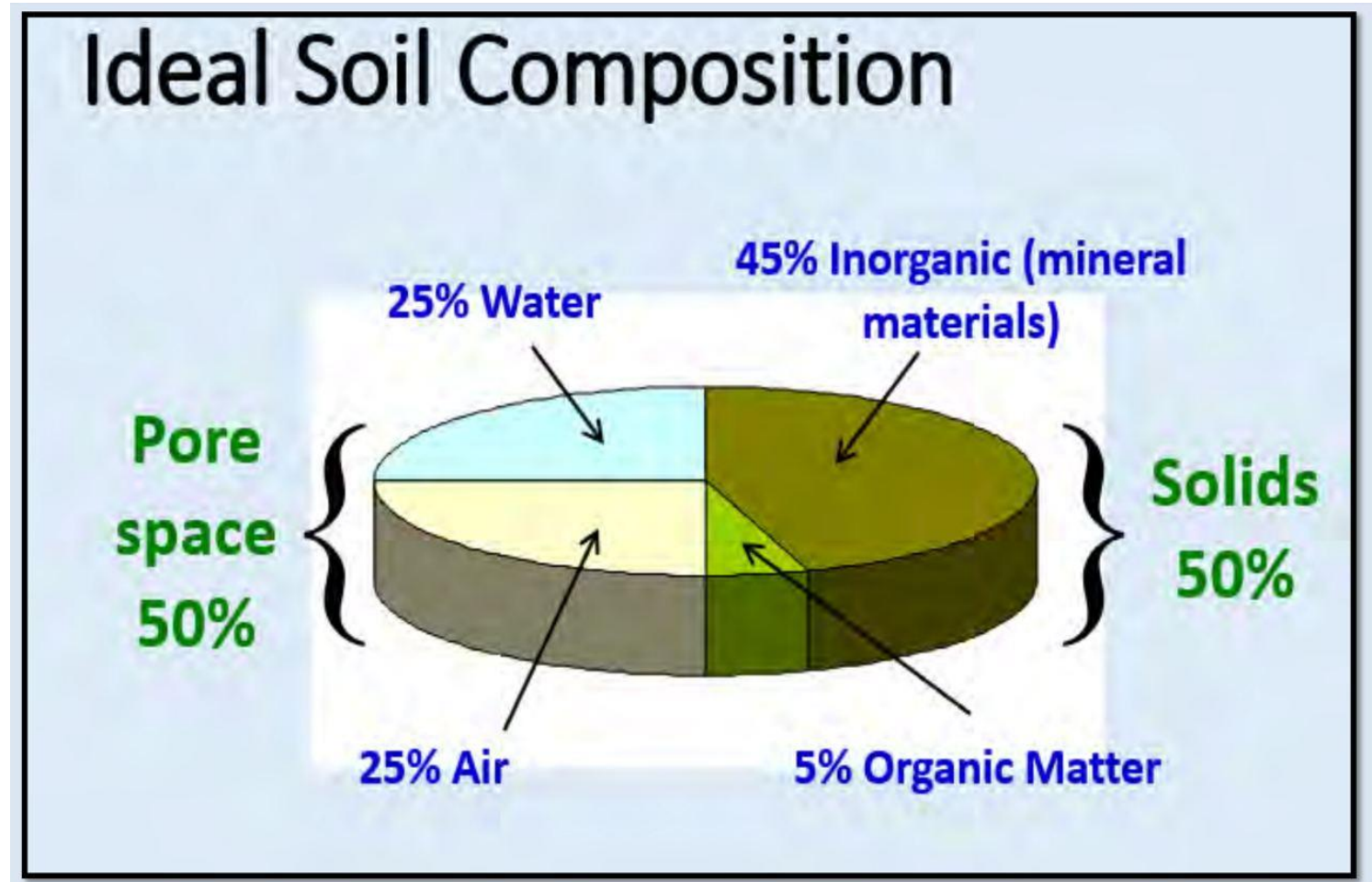
Introduction to the Concept & Soil Functions

- The Spheres of the Soil

- Detritusphere
- Drilosphere
- Rhizosphere
- Aggregtusphere
- Porosphere



Introduction to the Concept & Soil Functions



Introduction to the Concept & Soil Functions

The Importance of Air Space

- These images are from hydro systems
- The left images have good air flow
- The right images have poor air flow
- Plants grown in soil are not different
- They need the same things
 - Air
 - Microbes
 - Nutrients
 - Water
- Which of these root systems?
 - Looks healthy to you
 - Do you want in your garden
 - Looks better able to fight diseases
 - Can better access nutrients



Buffers Don't Really Work Without a Healthy Water Cycle

- Once water starts moving across the land it will down trees, sweep grass flat, find and create new channels, etc.
- Every inch that falls on one acre of water shed is over 27,000 gallons of water, if infiltration is poor, much of it runs across the surface.
- If you are catching even just 10 acres of rain at 1 inch, you are asking a riparian strip to infiltrate almost 300,000 gallons of water.
- An airplane flight in spring across the nation will show you just how bad the problem is.



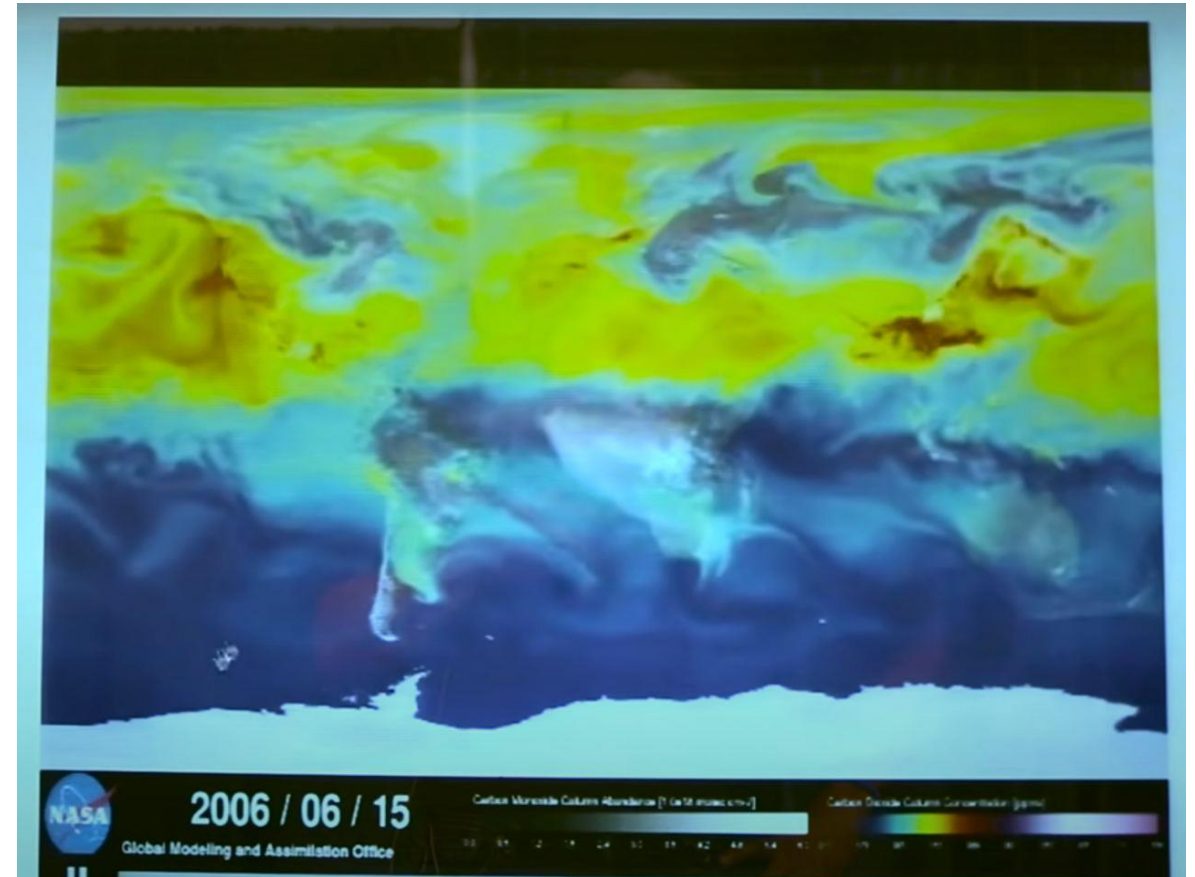
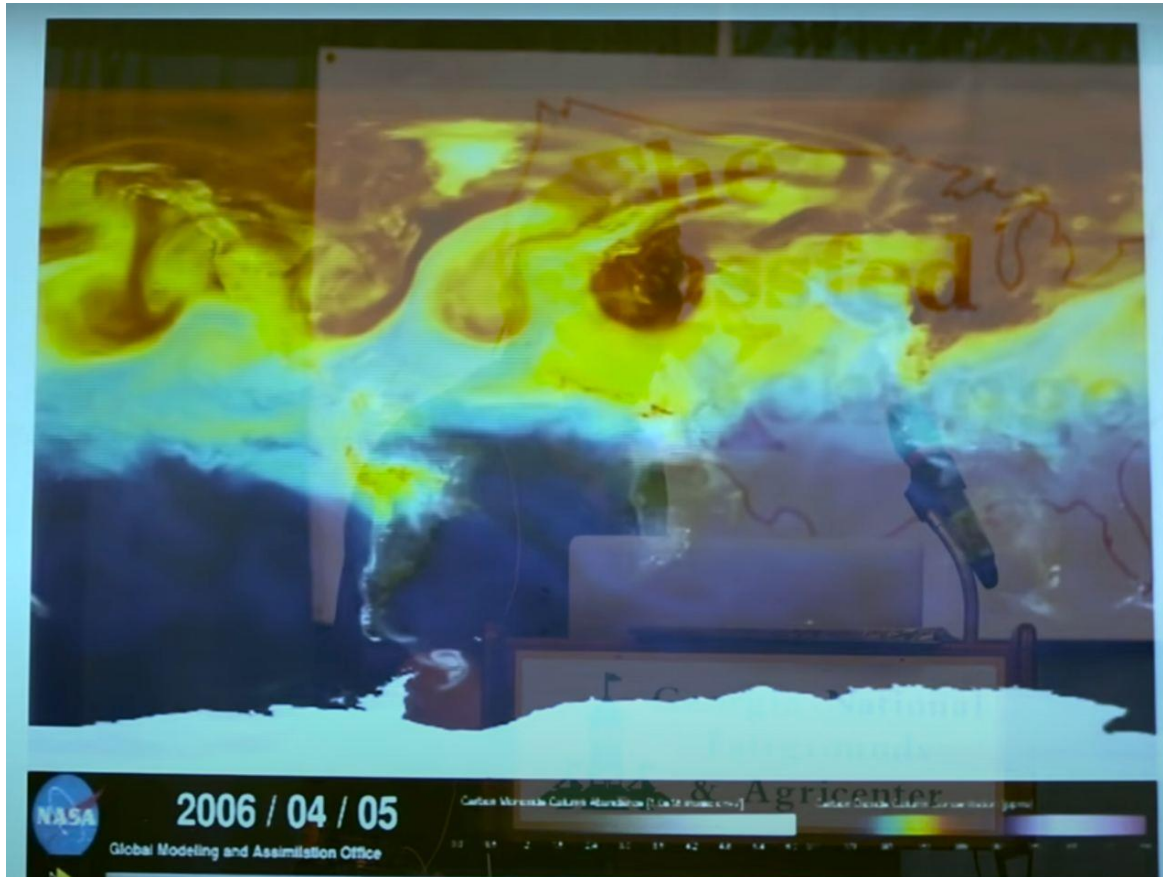
Tillage vs. Healthy Soils

What Happens When We Till – Hair Net Weeds are Germination Triggered



Tillage vs. Healthy Soils

What Happens When We Till – Carbon is Released into the Atmosphere



Tillage vs. Healthy Soils

What Happens When We Till – Soil is Loose at First and Blows/Washes Away Then Compacts



Tillage vs. Healthy Soils

What Happens When We Till – R-Strategist Bacteria Explode in Population Consuming Organic Matter



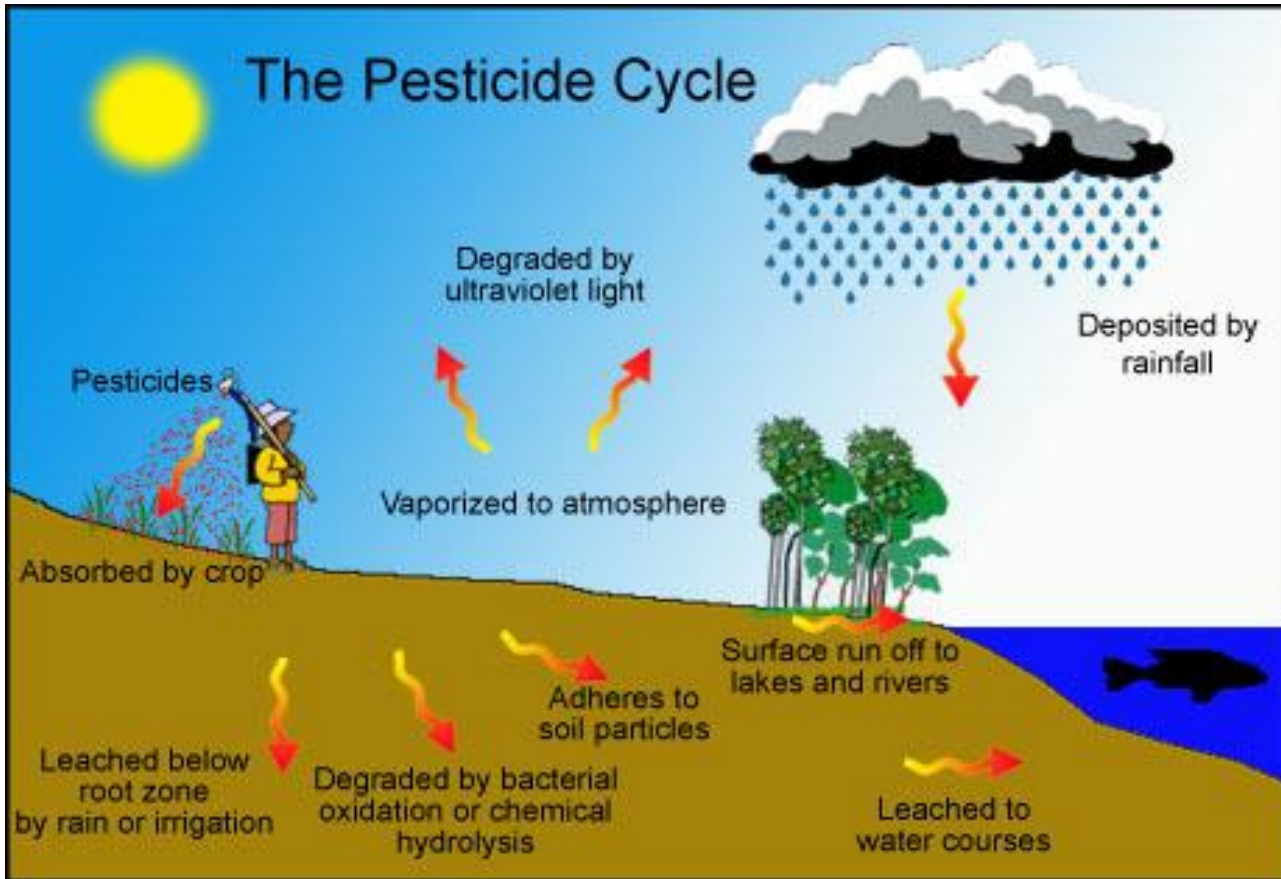
Tillage vs. Healthy Soils

What Happens When We Till – Tap Root Weeds Are Triggered to Germinate



Tillage vs. Healthy Soils

What Happens When We Till – The Cycles We Don't Want Continues



Tillage vs. Healthy Soils

How Do We Protect the Soil – Stop Using the Chemical “Cocktails of the Cides” (killers)

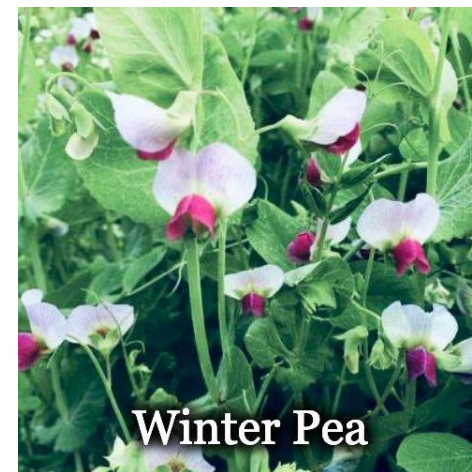
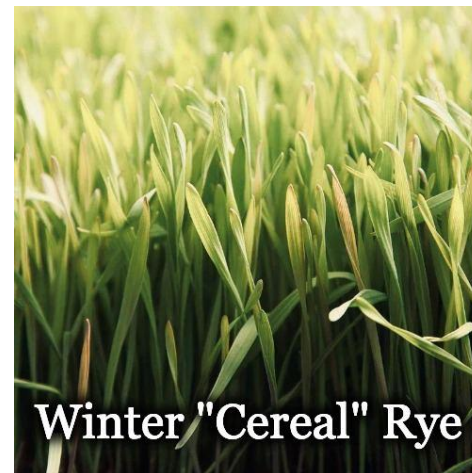


Fall/Winter Cover Crop Options

The King and Queen of Winter Cover Crops – Cereal Rye & Winter Pea

What to Know

- If you made me pick only two winter cover this would be them
- The root systems are huge
- Rye Highly cold tolerant (survives temps as low as -35F)
- Can be mowed and regrow in winter
- Rye is mildly allelopathic (small very shallow seeds only)
- Pea gives root depth diversity and fixes nitrogen
- Pea provides more top growth N for Rye's C
- Pea is edible (shoots and pods) & easy to terminate
- Pea handles temps down to 10 degrees F
- Together they provide a LOT of biomass

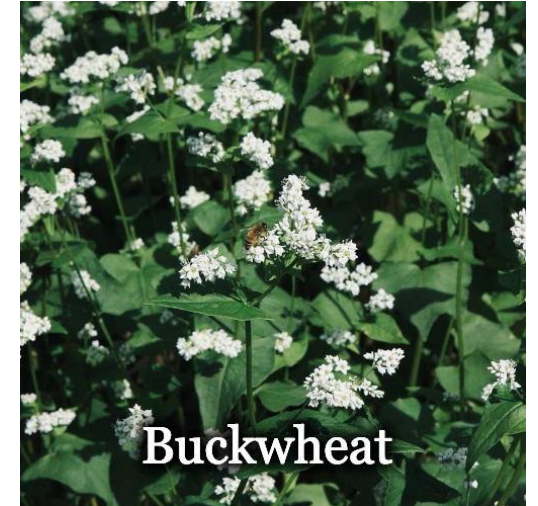
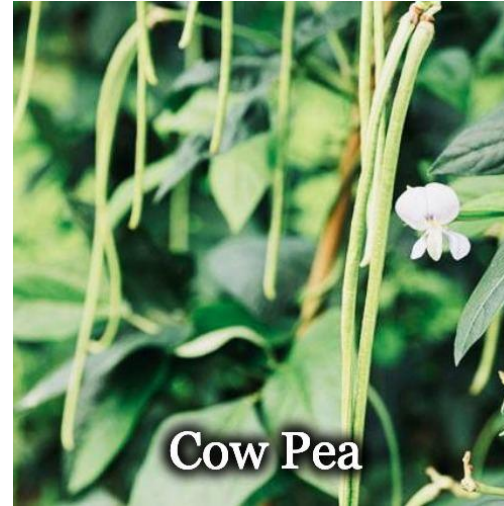


Spring/Summer Cover Crop Options

The King of Summer Cover Crops – Buckwheat & Cowpea

What to Know

- If you made me pick only two summer covers this is it
- Both root systems are large
- Buckwheat can grow to flower and seed in 6 weeks
- Buckwheat is a Huge attractor of honey bees and pollinators
- Very good weed suppression (Buckwheat)
- Excellent fodder (increased UV sensitivity, no more than 30% of diet)
- Cowpea Can fix 100-150lbs of nitrogen to the acre (peanut inoculant)
- Cowpeas have “extrafloral nectaries”
- There are many cowpea cultivars for diverse niches
 - (best are old varieties Red Ripper, Iron & Clay, Chinese Red, etc.)
- Both Provide
 - Low pest pressure
 - Large amounts of organic matter
 - Rapid turn over
 - Reliable winter kill



Methods of Termination

- Summer/Winter Kill
- Crimping
- Flaming
- Chop and Drop (mowing)
- Tilling In
- Herbicide
- Grazing (Chicken or Rabbit Tractors)
- Tarping (minimum 2-3 weeks)
- Combinations

My go to is flame, then crimp, then mulch, then if time or situation permits tarp.



Chapter Nine – Developing Mixes, Species Selection & Planting Methods

A Simple Set of Rules to Follow

- At least one grass
- At least one brassica
- At least one nitrogen fixer
- At least two of one of the above options
- Or include flowers especially in spring and summer
- Select for several different root types and depths
- When in doubt select more variety
- If you have concerns test small areas, individual beds, etc



Matching Benefits with Context & Goals

Understanding Tactics, Techniques & Strategy

- Technique – methods used to preform a task
 - Tactics – Short term actions for immediate goals
 - Strategy – Long term planning for over arching objectives
-
- Technique – Broadcasting or drilling seed
 - Tactic - Planting immediately after harvest to protect the ground
 - Strategy – Annually using diverse covers to increase soil health, water retention, biodiversity to combine for long term garden sustainability and productivity



Matching Benefits with Context & Goals

Context is Determined by Answering Questions

- What do you want to gain from your cover
- What are you planting next
- When are you going to plant (cover and follow crops)
- What is your climate
- What is your method of termination going to be
- How large is the plot to be planted
- What time will the cover be growing though
- What do you how to gain beyond soil improvement

The Hard Part

- No one can really answer these questions but you
- It is why you don't get answers to "what mix should I use" by people who are informed.



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Winter Cover Crops

- Cereal Rye
- Winter Pea
- Barley
- Wheat
- Triticale
- Oats
- Bell Beans
- Fava Beans
- Vetch
- Radish
- Mustards
- Turnips
- Sugar Beet
- Rye Grass
- Alfalfa
- Clovers

Summer Cover Crops

- Cowpea
- Buckwheat
- Sudex
- Sorghum
- Japanese Millet
- Pear Millet
- Sun Hemp
- Velvet Bean
- Soy Bean
- Lab Lab
- Mung Bean
- Guar Bean
- Hubam clover
- Tepary Beans
- Flax

Sweet 16 Interplanting Flowers

- Phacelia
- Marigold
- Chamomile
- Alyssum
- Nasturtium
- Calendula
- Borage
- Sunflower
- Phlox
- Cosmos
- Zinnia
- Mex. Sunflower
- Daisy
- Lupines
- Partridge Pea
- Blue Salvia

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