



THE SURVIVAL PODCAST
WITH JACK SPIRKO

"Helping you live a better life, if times get tough or even if they don't."



Biochar on the Homestead or Small Farm

Presented by Jack Spirko

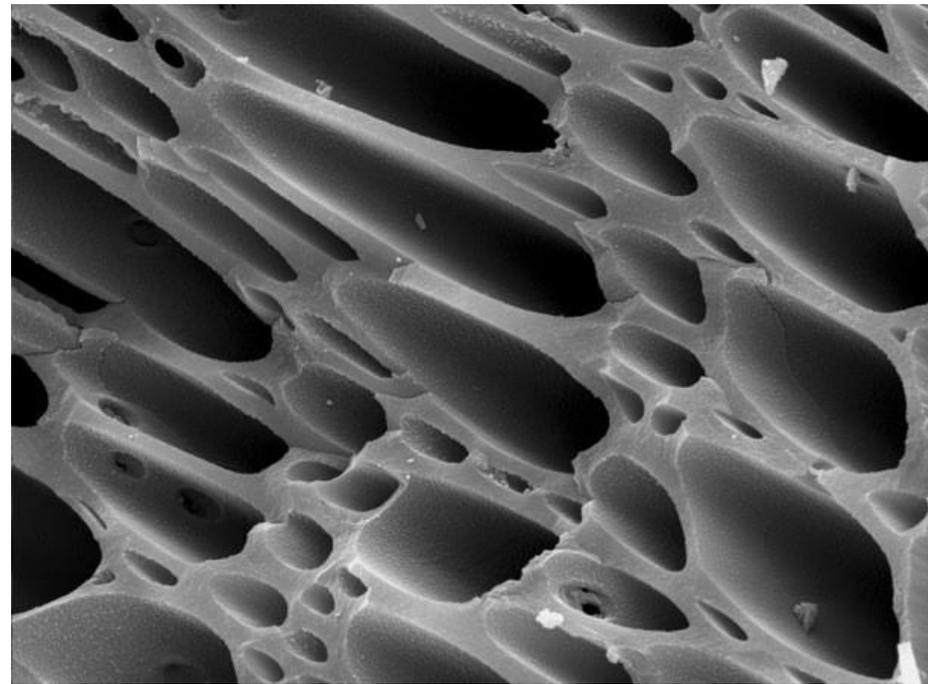
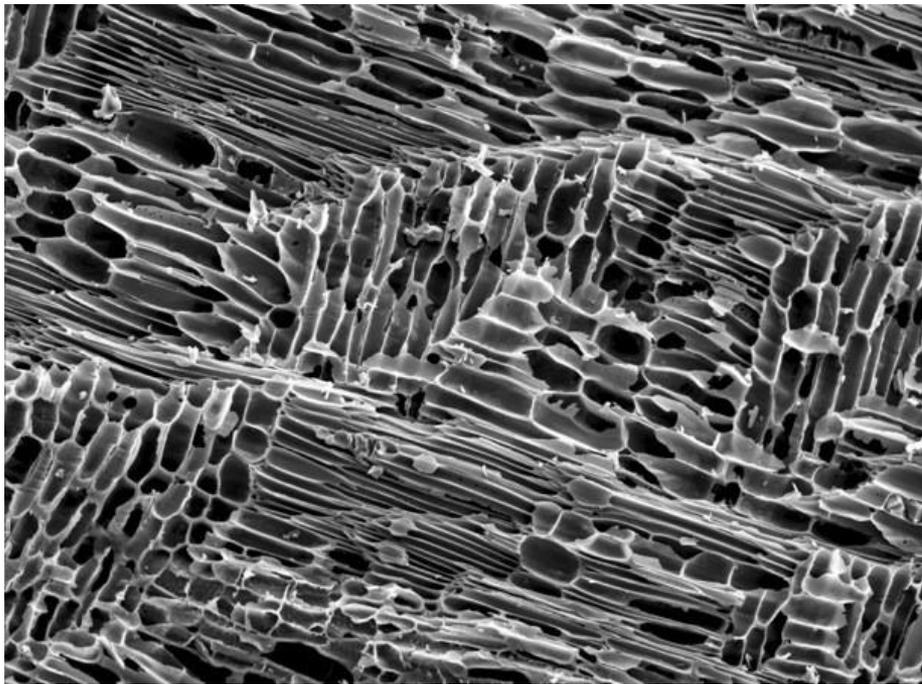


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All Biochar is Charcoal but Not all Charcoal is Biochar



“Biochar is to the soil as coral is to the sea”!

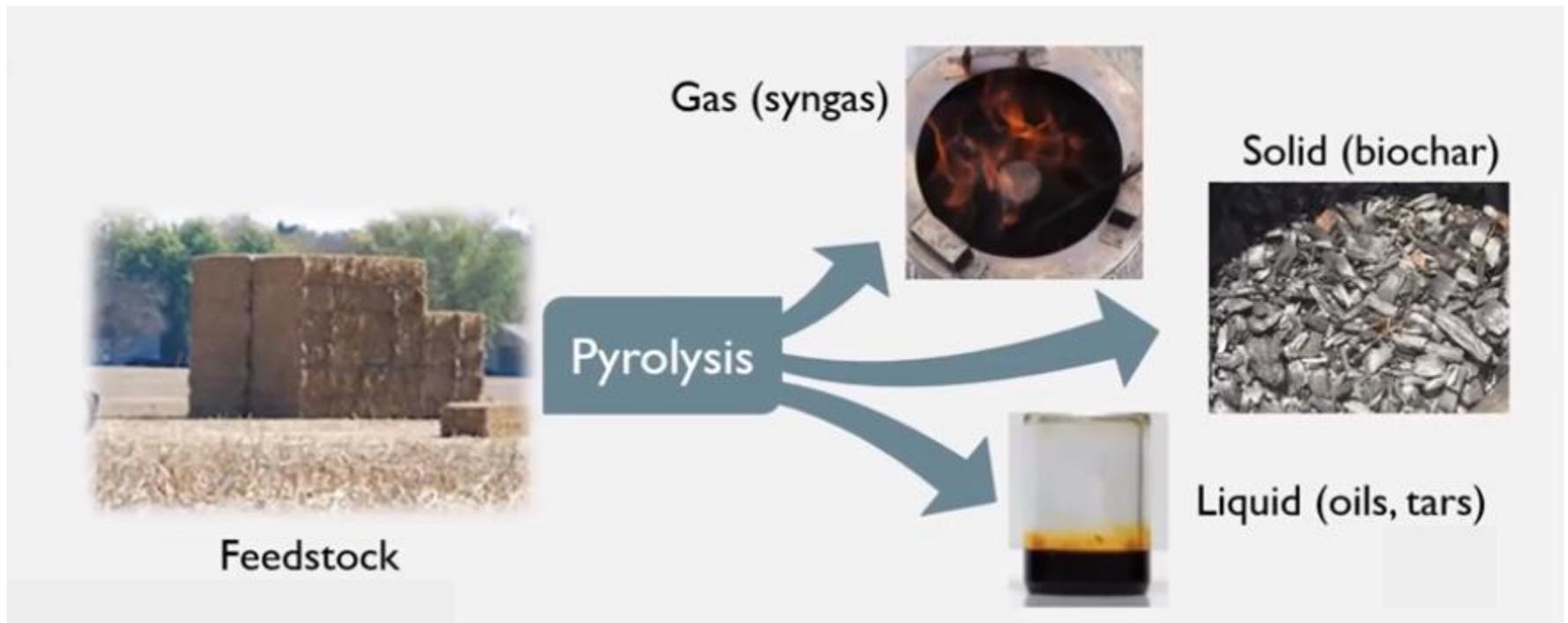


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What is Biochar vs. Charcoal





The Most Famous Biochar Use Case



Terra Preta
(Oxisol + biochar)

Oxisol
(tropical soil)

Terra Preta Soils

- Developed in Amazonia
- Civilization of Millions
- Contains..
 - Human wastes
 - Pottery shards
 - Animal bones
 - Shellfish remains
- Remains fertile 500 years+
- Seems to “grow back”
- Not the only example
- Most likely began as an accident
- Unique combo of microbes



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Biochar Has Many Uses Beyond the Soil

- Reduce smell and nutrient off gassing in livestock bedding
- Improve feed use efficiency in livestock
- Bind up human waste in off grid situations
- Insulation in alternative building technology
- Toxic soil remediation
- Aquatic systems filtration
- Preventing pesticide runoff in ground water
- Lightning potting soil instead of perlite or peat
- And of course as a soil amendment





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What Makes a Good Feedstock

- Tree trimmings/slash
- Waste cuttings from saw mills
- Wood chips (it depends)
- Ag waste like corn cobs/stover
- Sunflower stalks and heads
- Switch grass
- Livestock Manure
- Sewage Solids
- Bagasse (sugar cane waste)
- Nut Hulls
- Wood pellets
- Technically anything carbon based



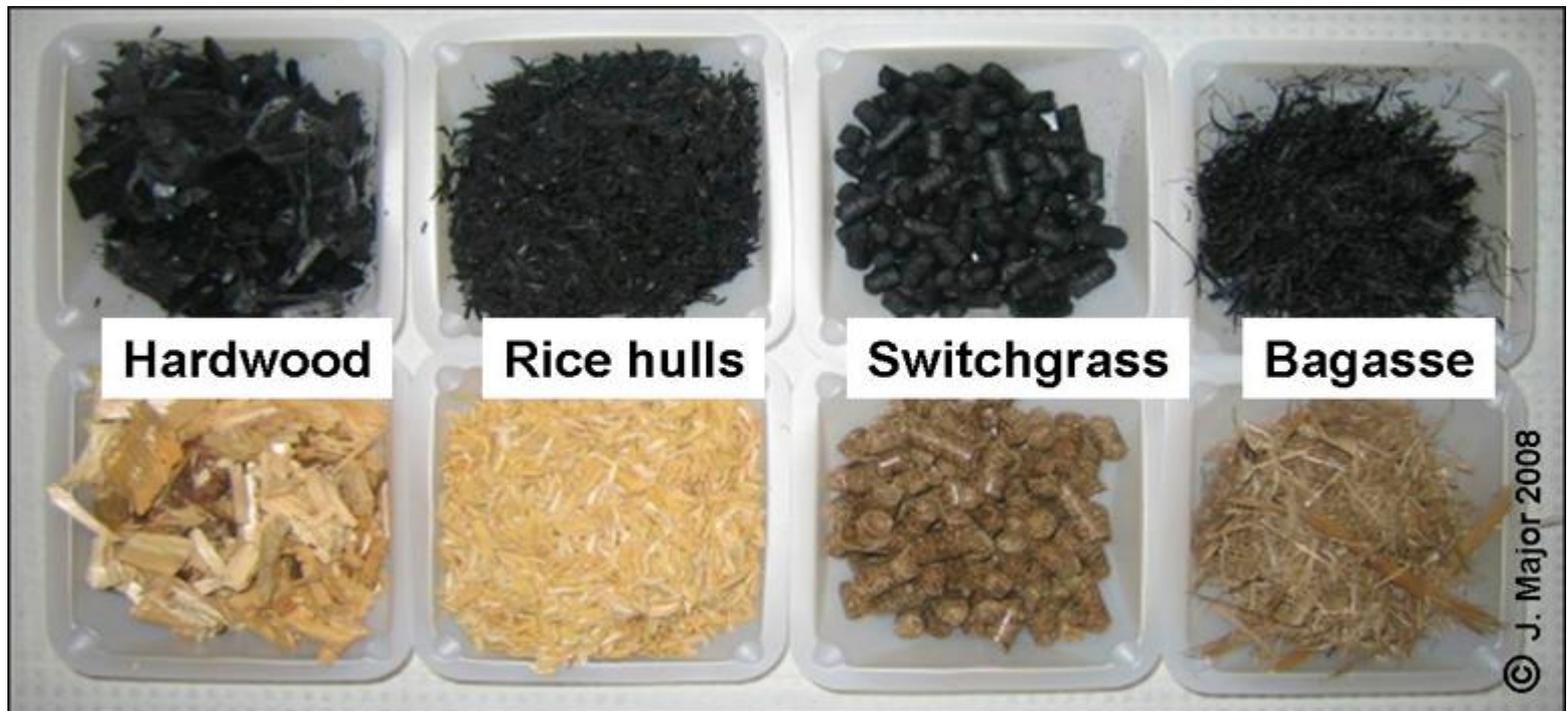


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Most Things Other Than Wood are Less than Optimal for Homestead Level Use





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Home Production Methods – Cone/Pyramid & Bin Style Kilns





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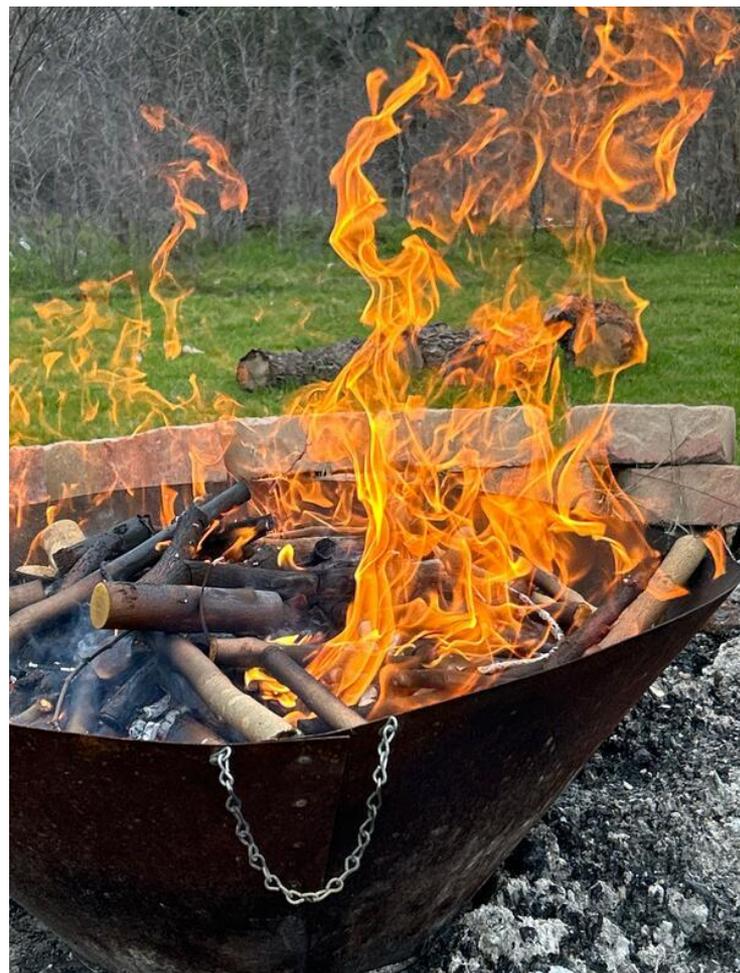
Home Production Methods – Cone/Pyramid & Bin Style Kilns

Advantages

- Super Simple
- Makes a good volume fast
- Easy to quench (from bottom)
- Works well even with fresh cut feed stock

Disadvantages

- Requires constant monitoring
- Requires constant feeding
- Requires sized material
- Significant smoke at times





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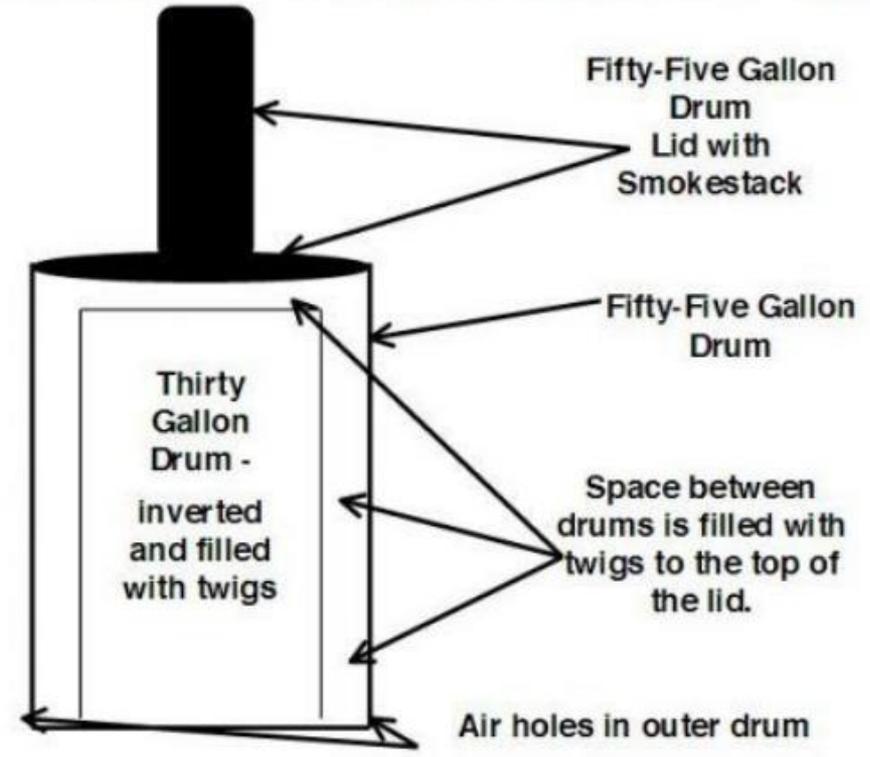
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Tin Man Retort



Two-Barrel Nested Biochar Retort— Prior to Burning



source:kerrcenter.com



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TLUD Kilns – Tin Man Retort



Advantages

- Self Regulation – No Cont. Feed
- Makes Reasonable Amounts
- Enables the use of the heat

Disadvantages

- Limited life cycle of drums
- Feedstock needs sizing
- Doesn't do well with wood chips
- Must be well seasoned feed stock



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Hookway Retort – Might be the Best I have Seen





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Hookway Retort – May be the Best I have Seen

Advantages

- Self Regulation – No Cont. Feed
- Makes Efficient Use of Space
- Enables the use of the heat
- Rocket Stove inside a Retort
- Extremely high quality char

Disadvantages

- More complex to build
- More expensive to build
- Feedstock needs sizing
- Feedstock needs to be seasoned
- Requires feeding for about an hour
- More labor to empty





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Stupid Simple Methods – Drums etc.



Cheap and Makes a Lot of Volume Fast



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Commercial Scale Kilns

At Large Scale Kilns can...

- Make bio char
- Heat buildings/greenhouses
- Generate electricity
 - Mine bitcoin
- Harvest wood vinegar
- Run with auto feed systems
- Heat ponds (aquaponics)





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How Do I Know I Made Good Biochar

- Low volume of ash
- No real flame left (open kilns)
- When dry it sounds like glass
- Crushes easily
- Rinses clean from the hands
- Burn was mostly smoke free
- Yield is about 30% by dry weight





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Once Char is Made it must be Crushed

- Genal advice is the smaller the better
- Max ¼ inch with a variety of sizes
- Most at home folks drive over it
- A commercial quality leaf vacuum is perfect
- I reburn any that don't crush to size easily





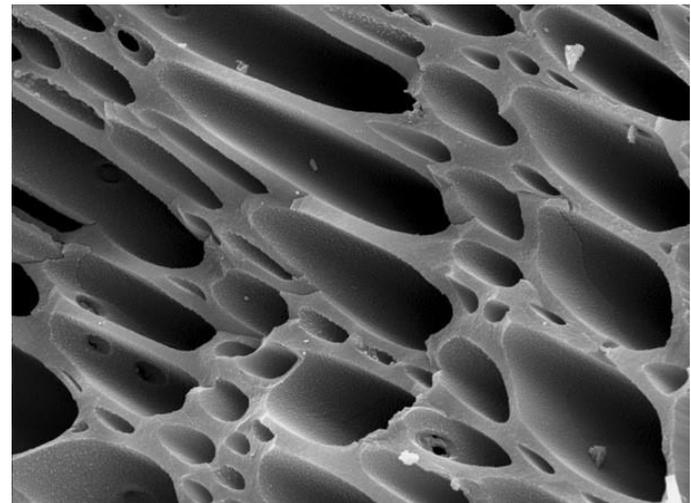
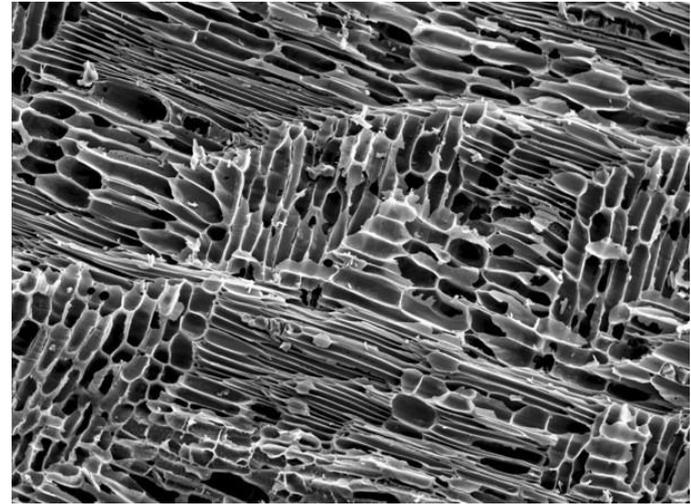
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Why Some Say Biochar Doesn't Work

- Must be inoculated before use
- Is a soil conditioner not fertilizer
- Intentionally flawed research
- Biochar will work best in living soils
- Biochar soils improve with time
- What type of biochar matters
- Most of this has been handled





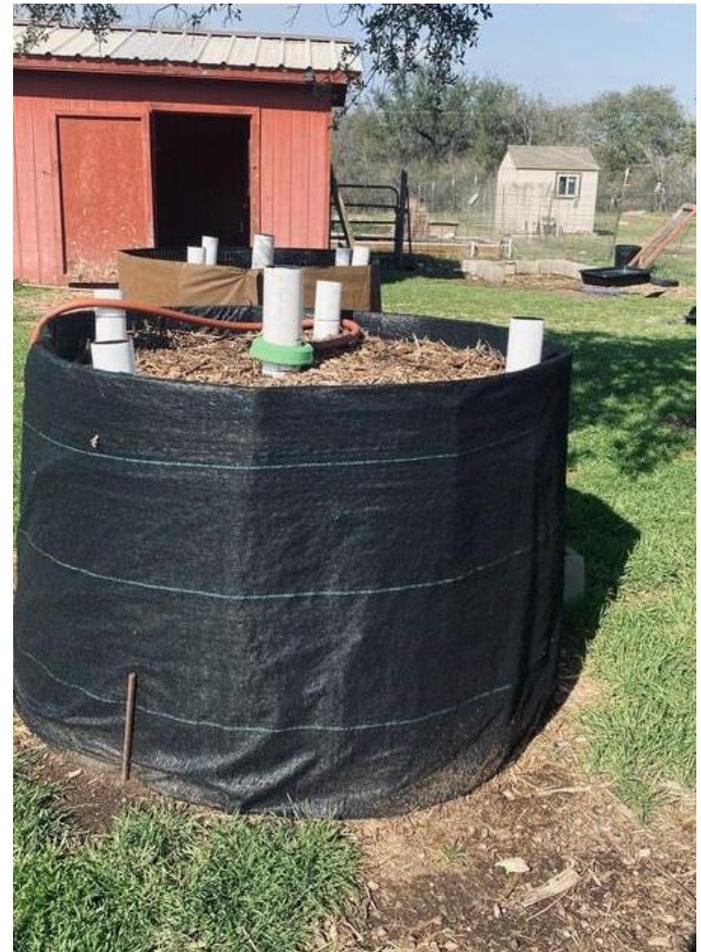
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Inoculation – Add it to Something You Already Do.

- The first step is to wet the char
- Inoculation with compost tea
- Inoculation with human urine
- Inoculation via the compost process
- Part of a compost toilet system
- Pass it through livestock
- Include it in livestock bedding
- Add it to completed compost
- Purchase it pre inoculated
- Use it in worm bins





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Getting Biochar into Your Soil

- Apply with seasonal compost
- Spot apply urine biochar
- Use it in seed starting mix
- Apply it in trenches in your garden
- “Moat” around trees
- Till in – first time only
- Add it when growing a cover crop
- Broad fork it
- Setting out transplants





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Once It's In Soil What Does it Do

- May slightly raise PH
- Provides a home for microbes
- Becomes a reserve for nutrients
- Holds 7X its weight in water
- Increases Cation Exchange (CEC)
- Increases Anion Exchange (AEC)
- Lightens tilth
- Increases carbon content
- Binds up toxins (adsorb no absorb)
- Promotes seed germination
 - Quick note on wood vinegar





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Resources Available at TheSurvivalPodcast.com/biochar

YouTube Videos

- Living Web Farms Full Workshops
 - [BioChar Inoculation](#)
 - [Biochar What, Why & How](#)
 - [Farm Scale Biochar](#)
- [Hookway Retort in Action](#)
- [8 Low Cost Ways to make Biochar](#)
- [Biochar with a Simple Drum Kiln](#)
- [60 Degree Angle Drum Method](#)
- [My Podcast with Mike Whittman](#)
- [My Podcast with Gloria Flora](#)
- [Super Simple Compost Inoculation](#)

Websites

- [Best Biochar Kiln \(what I own\)](#)
- [Blue Sky Biochar](#)
- [New England Biochar](#)
- [US Biochar Initiative](#)

Books

- [Gardening with Biochar](#)
- [1491 America Before Columbus](#)
- [The Biochar Soluiton](#)
- [Terra Preta](#)
- [Biochar for Home Gardeners](#)



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Learn More and Connect

Everything you need to connect with me and expand on this presentation including a recording of it, is at

TheSurvivalPodcast.com/biochar