



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

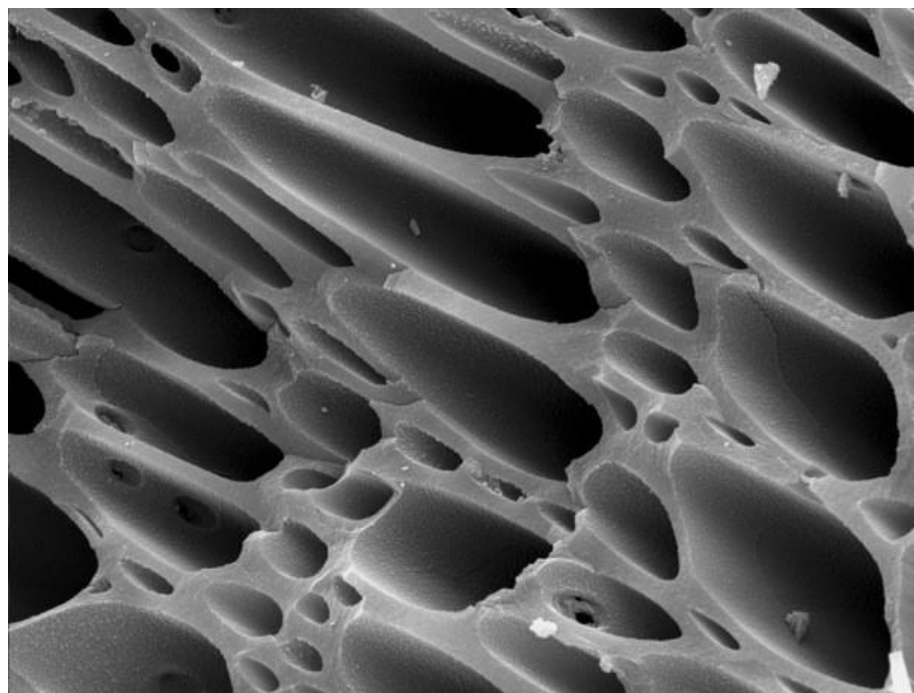
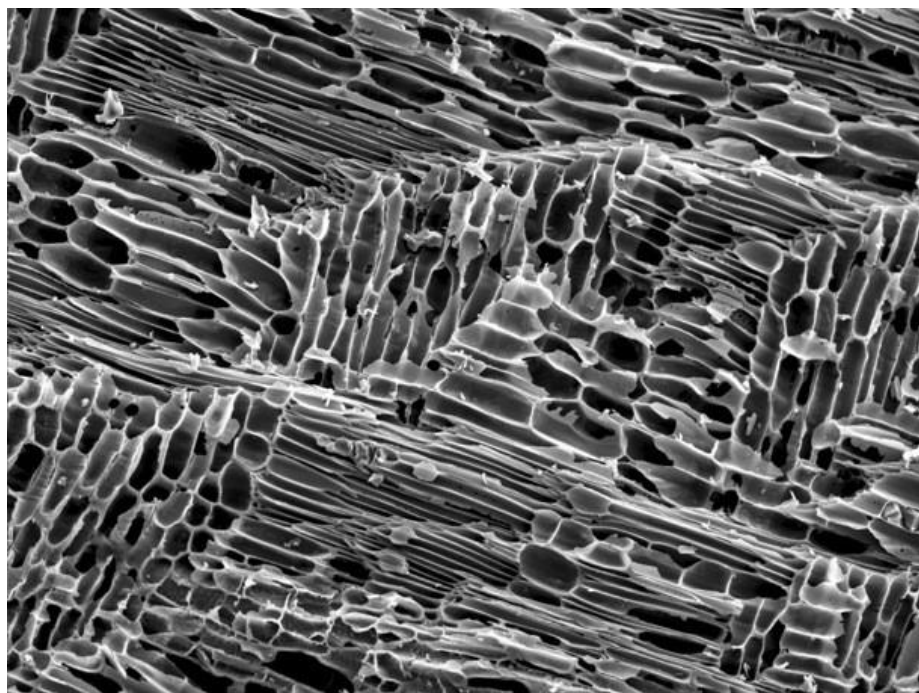


THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



All Biochar is Charcoal but Not all Charcoal is Biochar



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

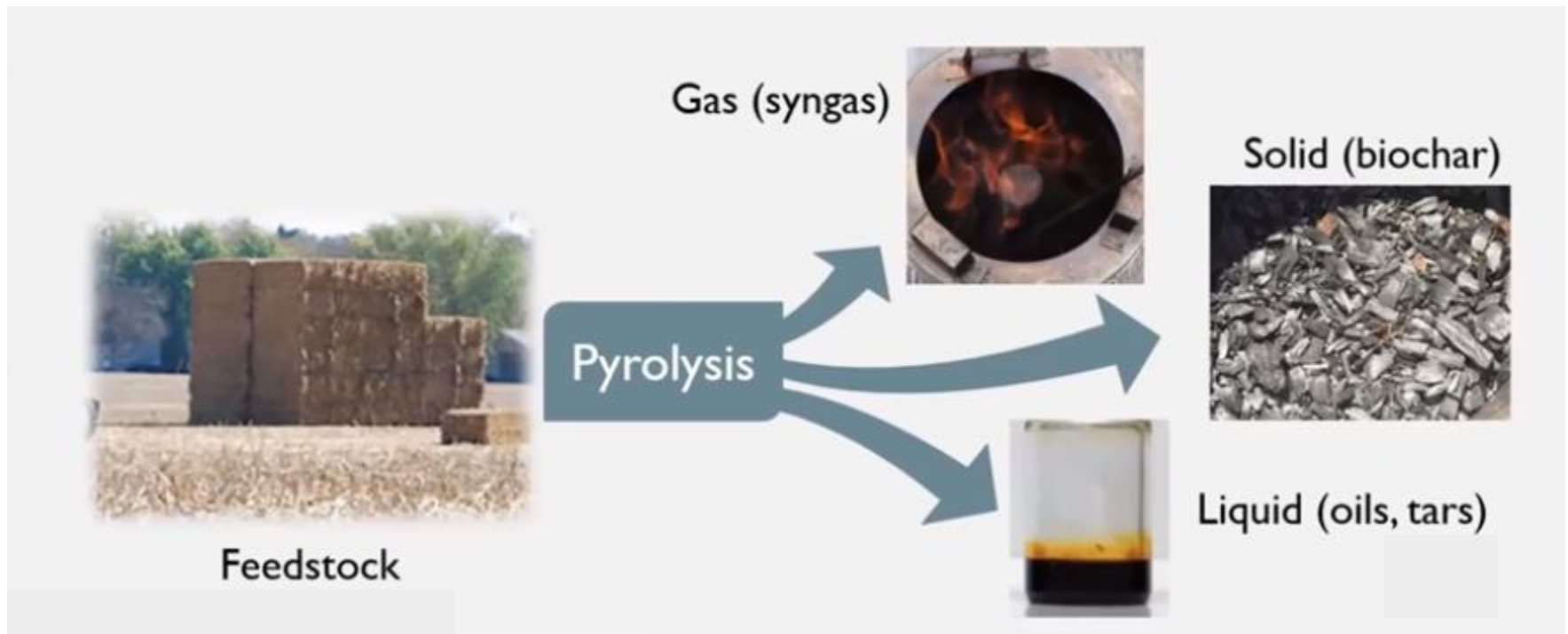


THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



What is Biochar vs. Charcoal





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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



THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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



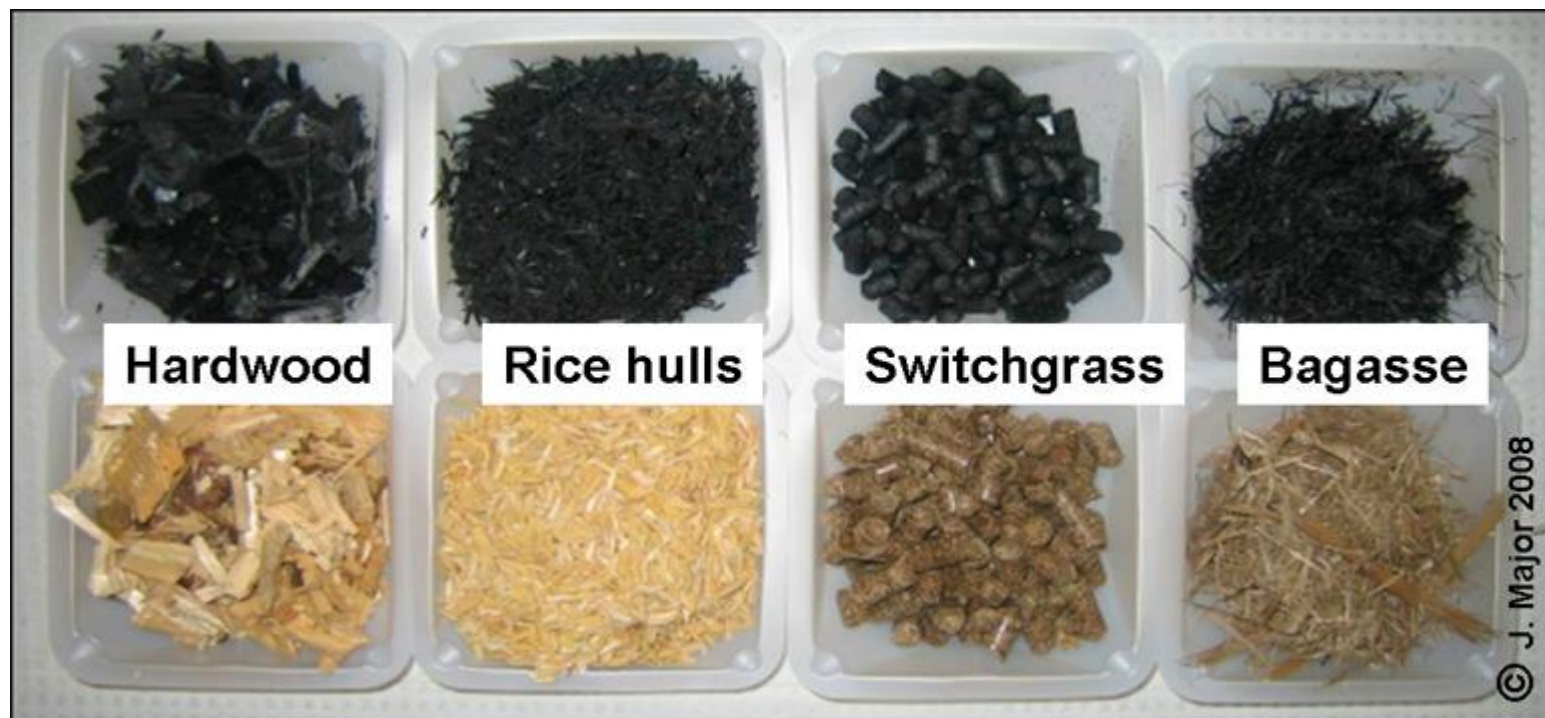


THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



Home Production Methods – Cone/Pyramid & Bin Style Kilns





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

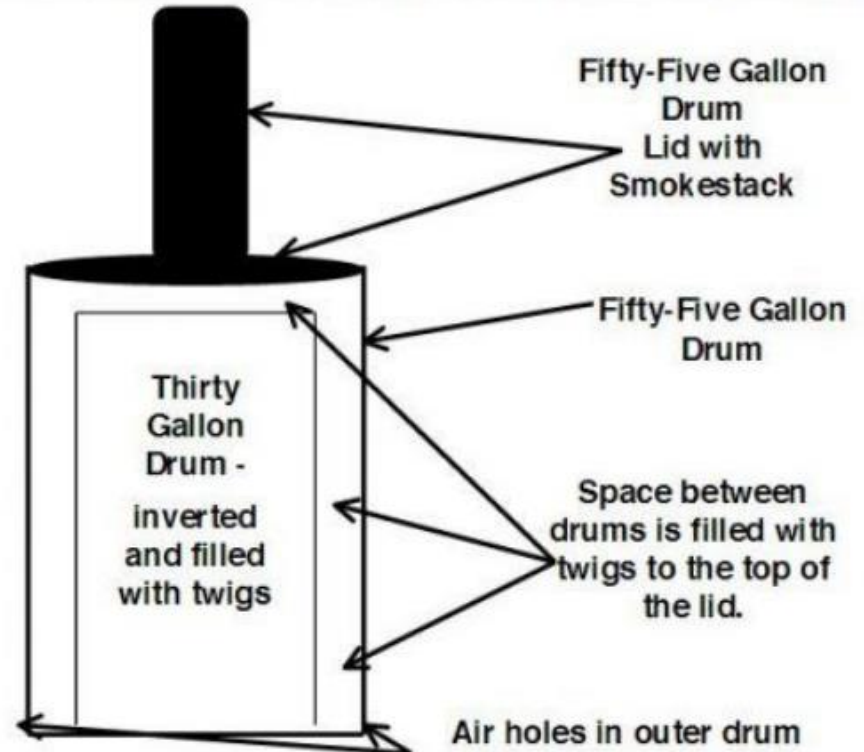
"Helping you live a better life, if times get tough or even if they don't."



Tin Man Retort



Two-Barrel Nested Biochar Retort—Prior to Burning



source:kerrcenter.com



THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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



THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



Hookway Retort – Might be the Best I have Seen





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



Stupid Simple Methods – Drums etc.



Cheap and Makes a Lot of Volume Fast



THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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)





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





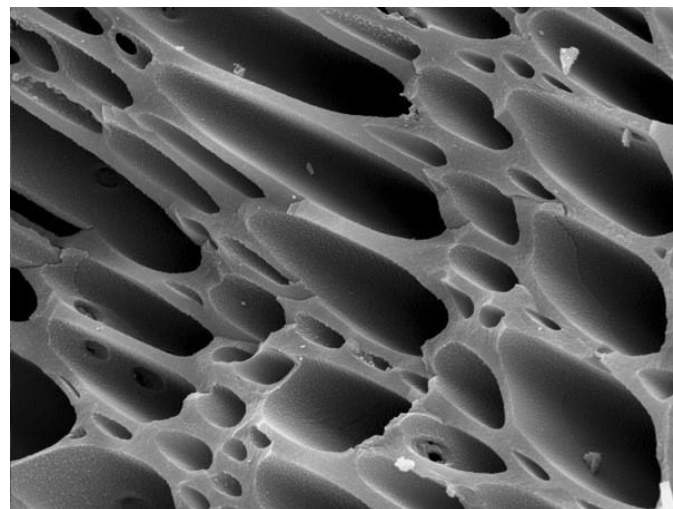
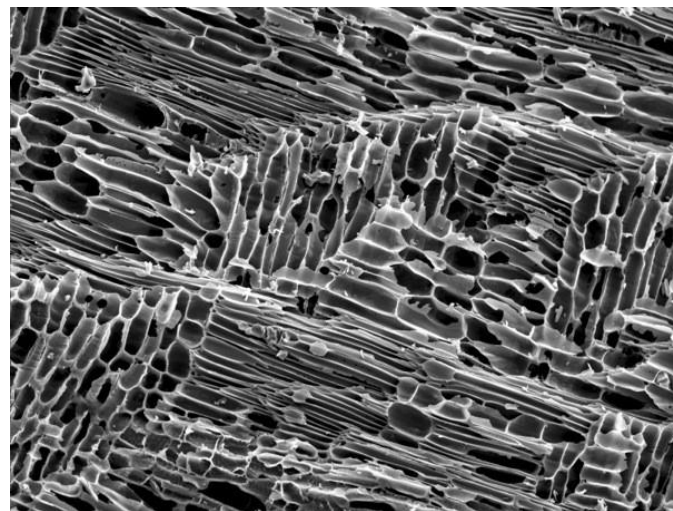
THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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





THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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](#)



THE SURVIVAL PODCAST
WITH JACK SPIRKO

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



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