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Biodiversity for a Livable Climate

Restoring Ecosystems to Reverse Global Warming

December 22, 2016

Dryland Farming Magic: Add Microbes, Not Water

We recently spoke with Charlotte Anthony, who runs Terra Lingua Farm, a 20-acre dryland farm in the desert of Eastern Oregon.

Bio4Climate: Hi Charlotte, thanks for taking some time to chat! Please tell us a little about Terra Lingua Farm, this project you started this past year.

Charlotte: Terra Lingua is a dryland farm, meaning it is non-irrigated and uses minimal water. The farm will have seven layers of plants, including fruit trees, nut trees, perennial plants, and lots of herbs. The idea is to have a wealth of crop diversity. We use microbial

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inoculation to increase the soil carbon content of the soil, so we need significantly less water than typical farming operations.

Bio4Climate: What are the ecological benefits of a dryland farm?

Charlotte: T he microbial system of plants exists outside of them, in the soil. Microbes are essential for healthy plants, but industrial agriculture removes almost all the microbes from the ground - so the plants can't do a proper job. That's why the pests come: the self-defense system of the plants isn't working right. Furthermore, without microbes in the soil, we're not getting the immunity from nutrient-dense plants; this leads to nutrient deficiencies in our diets.

The farm only requires 8 to 14 inches of water per year to grow food. We get about 1 inch of rain per month in the Oregon desert, and it's typically done raining by 9 AM. But when you have all these green absorbent plants, the soil really retains that water. The only way to have a system where you don't have to water or fertilize is to increase the carbon sequestration of the soil.

In addition, our yields come throughout the year, not all at once. You're not dependent on one crop. So if one crop doesn't produce that much in that season you have a wide diversity of other crops to fall back on. This also makes for happier pickers because you don't have a transient work force; you can have 10 people who harvest year-round.

Bio4Climate: How do you create a productive farm in the desert?

Charlotte: You inoculate the land with microbes, which store carbon. The microbes build humus - the organic matter that retains moisture and nutrients in the soil - and the soil becomes water efficient and also increases the nutrient density of the plants.

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The Bio4Climate Holiday Beaver says:

We beavers are ready to go to work, healing land, preventing drought, controlling floods, bringing back biodiversity. Humans have driven us close to extinction, and now they need our help. They're starting to come around and we're willing to forgive and forget, but we could use a little encouragement here.

And we get it from Biodiversity from a Livable Climate! You can help beaverdom by donating generously this year. Just press this little button below and cyber-magic will do the rest (it's not nearly as good as beaver-magic, but that's OK, not

Aranya's Farm: a Permaculture Farm in India that inspired Charlotte. PC: permaculturein dia.org

Bio4Climate: Do you see this as a viable replacement for large-scale agriculture?

Charlotte: This system requires skills that are much more in tune with the land. This is what is lacking in industrial agriculture. The European method is very intensive: when farmers aren't physically doing work, they're having machines do it. There is a paradigm blocking many people from engaging in this work but we can solve many of the problems facing industrial agriculture - the decrease in nutrient density, pest control, colony collapse disorder - by treating our land properly. Industrial mechanisms have almost no microbes in the ground, so plants can't do their job and that's why the pests come.

We've stripped our ecosystems and compromised the seeds, the soil, and the pollinators. We can solve these problems by regenerating the land - by treating the soil with microbes. If you reintroduce microbes to the soil, you don't have to buy pesticides and fertilizers or spend money on irrigation, and you'll reap higher profits for your crops. Essentially this makes industrial farming obsolete.

Bio4Climate: It's very interesting to hear about the potential of dryland systems. You also host permaculture workshops. Who are they for?

Charlotte: I've been working with people in Cambridge and Lexington, MA who want to take out their lawns and replace them with a more sustainable alternative. I work as a consultant, and show people how to spray microbes into the space where lawns use

everyone can be a superstar like us!)

About Bio4Climate

Through education, policy and outreach, our mission is to promote the power of the natural world to stabilize the climate and to restore biodiversity to ecosystems worldwide. Collaborating with organizations around the globe, we advocate for the restoration of soil, and of grassland, forest, wetland, coastal and ocean ecosystems--along with the associated carbon, water and nutrient cycles --to draw down excess atmospheric greenhouse gases, cool the biosphere, and reverse global warming, for the benefit of all people and all life on earth.

Learn more about our ongoing projects, upcoming events and find additional information and resources at bio4climate.org.

to be, in order to make it a carbon sequestering system.

Bio4Climate: What are some of your upcoming projects for 2017?

Charlotte: On Terra Lingua, we'll be planting fruit and nut trees, berry bushes, and lots of herbs. The plan is to show people in the desert and in California's Central Valley that if they choose these methods they can both make money and retain precious water. We can demonstrate significant yields in places that were once solely desert. Most farmers are stressed. Farmers in Massachusetts experienced a severe drought this year, and many know they need to do something different, so I'd like to help them out as well.

Bio4Climate: You also spoke at our most recent Oceans conference in November! Any thoughts on the weekend?

Charlotte: Yes, I spoke about Terra Lingua and on farming practices that can sequester more carbon. I really enjoyed the conference and loved the format of having 30-minute presentations, and then a Q&A session. This is how we can get scientists out of their silos and achieve a better sense of the wider world.

Bio4Climate: Thanks for chatting with us, Charlotte. It sounds like you have exciting plans for the upcoming year. Where is the best place for interested home gardeners, farmers or readers to reach you?

Charlotte: They can drop me a line or two by email, at victorygardensforall@gmail.com

Charlotte also recently presented at one of Bio4Climate's Meetups. Join our Meetup group and stay up to date on the latest agro-ecological efforts to reverse climate change!

Thank You, *Oceans* Attendees, Speakers and Supporters!

Watch the Homeschool Symbiosis Team's presentation on the origin of the oceans!

We are so grateful for all of you who attended, spoke at and/or supported our latest conference, *Restoring Oceans, Restoring Climate.* It was another wonderful weekend full of exciting research on oceans, including how oceans may hold powerful climate solutions.

A few quotes on the weekend:

"Feeling totally in awe at your ability to deliver such thought-provoking, hopeful, and totally engaging conferences. They just get better and better." -Lori Gill-Pazaris

"This was a really FABULOUS conference. I learned an amazing amount that I didn't know! I've been to many conferences during my career and I was really impressed with the impeccable quality of both the research presented and the researchers presenting." -Fred Jennings

"What a great experience it was to attend the Restoring Oceans, Restoring Climate conference put on by Biodiversity for a Livable Climate. The information provided was top-notch, and, while the science and stats are sobering, there is also plenty of hope provided by a number of varied ingenious initiatives on the ground and in the seas. Not only did my husband and I learn a lot, but we're also now motivated to get more involved in these efforts - there is a lot of work to be done. Thank you Bio4Climate!" -Liz Merritt

We now have seven highly successful conferences behind us on the road to restoring ecosystems to reverse global warming. Video presentations from our Oceans conference are up and ready to view!