



NewEarth™ E-Char

is Bio Char for Soil Amendment



E-Char is Bio Char for Soil Amendment, Carbon Sequestration, Waste Management and More
www.newearth1.net

1. What is E-Char™?

E-char is the highest quality biochars made exclusively by NewEarth using its revolutionary ECO Pyro-Torrefaction technology. Biochar is a natural soil amendment that can increase crop yields by as much as 200% in some crops according to several global scientific studies. The Intergovernmental Panel on Climate Change (IPCC) has stated that biochar is a proven way to sequester carbon from the atmosphere. The science behind biochar was inspired by the practice of making “terra preta” or “black earth” a process of creating carbon rich black soils developed by the People of the Amazon Basin, which they used for thousands of years to increase their crop production. E-Char revives poor exhausted soils, increases and holds moisture in topsoil, and stops soil erosion, etc. E-Char keeps valuable nutrients in the topsoil, and is the perfect way to increase crop yields in an environmentally sustainable way using less land, while reducing or even eliminating the need for harmful chemical fertilizers.



2. How is E-Char made?

NewEarth makes its standardized high quality E-Char (biochars) exclusively using its proprietary ECO Pyro-Torrefaction (EPT) technology. NewEarth begins the process of making its E-Char by selecting sustainably grown 100% biomass feedstocks, such as woody biomass, agricultural waste, energy crops (E-Crop), grasses, etc. Then NewEarth converts the raw biomass via its EPT process into various types of reliable standardized high quality biochars.

ECO Pyro-Torrefaction (EPT) is a continuous flow thermal cycling process that operates around 500 C degrees using an advanced industrial scale non-oxygenated vacuum reactor. The thermo-chemical conversion drives off the volatile components of the biomass and stabilizes the remaining carbon into a black, highly aromatic solid biochar and other co-products. It is important to remember all biochar is not a like. Only NewEarth offers standardized high quality biochars made from an environmentally friendly self-sustaining continuous flow process that is non-polluting.

NewEarth has both mobile EPT technology and centralized EPT technology. Mobile units offer the benefits of converting biomass feedstocks to biochar and renewable fuels at any location.

3. What are the benefits of E-Char?

NewEarth specifically makes E-Char to offer the best growing conditions to its users. The following is a short list of some of the benefits of E-Char.

- E-Char increases the water holding capacity of the soil
- E-Char increases biomass (crop) production and yield by as much as 200% in some crops
- E-Char increases soil carbon levels
- E-Char improves the soil pH for optimal plant growing conditions
- E-Char decreases aluminum toxicity
- E-Char decreases emissions from soil of the greenhouse gases CO₂, NO_x, CH₄, etc.
- E-Char improves soil conditions for earthworm populations
- E-Char increase cation exchange capacity (CEC), especially over the long-term
- E-Char improves fertilizer use efficiency
- E-Char decreases tensile strength
- E-Char changes the microbiology of the soil for favorable plant growth conditions

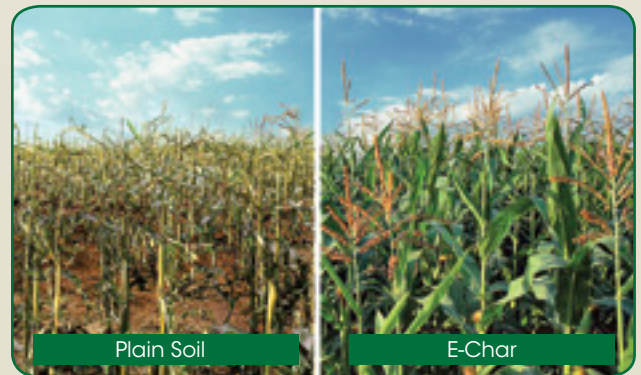
4. Is ALL bio char the same?

NO. There are very important differences in biochar from the way it is made, to the properties and characteristics of various forms of biochar. Some biochar processes are quite polluting and very harmful to the environment. For NewEarth sustainability is our #1 ethos. NewEarth’s biochar is made in an environmentally friendly and sustainable way using its EPT process, which does not require external energy to drive the thermal reaction. The NewEarth EPT process produces extremely low clean emissions, which are mostly just steam, because the biogases produced are recycled and used to power and heat the EPT process.

The key chemical and physical properties of biochar are greatly affected by the type of feedstock used and the processing conditions under which biochar is made such as temperature, residence time, heating rate, feedstock preparation and size, etc. It is for these reasons that NewEarth has developed high quality standardized biochars called E-Char to guarantee its users consistent results every time.

5. What are the advantages of NewEarth Technology?

Producing biochar from traditional, low-tech, or batch methods may actually result in producing more greenhouse-gas emissions and pollution than from simply burning the plants for fuel or discarding them. NewEarth's EPT technology for making its biochar, is operated from the biogas it produces. According to the Institute for Governance and Sustainable Development (IGSD), the output of a modern pyrolysis plants is between three and nine times the energy input required. However at NewEarth's EPT plant it is a minimum of 12 times the output versus the energy input required. This is a major achievement.



Biochar is only commercially produced through some kind of pyrolysis process. In the production of biochar via the pyrolysis process, the amount of biochar to be produced depends on the accelerating or slowing down of the pyrolysis process. Most pyrolysis processes focus on the production of high volumes of bio-oil, with the aim of manufacturing liquid transportation fuels from biomass. These types of pyrolysis processes use very high-temperature fast pyrolysis technologies. As a result of these types of technologies very small amounts of biochar are produced.

Low-temperature slow pyrolysis technologies produce larger quantities of biochar and very small quantities of bio-oil. However, low temperature or slow pyrolysis decreases the exchange properties and surface area of the bio-oil, which means a lower quality of biochar.

NewEarth's EPT is a medium range pyrolysis process embracing the best of both worlds. The output of both biochar and bio-oil are nearly equal. The EPT process has the minimum energy to product output (12 times the energy input required), which is driven by a self-sustaining thermal reaction. This means NewEarth creates more renewable fuels and biochar with less energy consumption, and a better environmental grade.

6. What is the carbon sequestration and greenhouse gas mitigation potential of E-Char?

Biochar's ability to sequester carbon from the atmosphere is proven. With NewEarth's biochar, one ton of E-Char equals a minimum of 3 tons of CO₂ sequestered from the atmosphere. The global potential for NewEarth's EPT technology and E-Char to sequester massive amounts of CO₂ and other greenhouse gases from the atmosphere to help save our planet is very promising, and available today. In addition, a minimum of 3 carbon credits are created for every ton of E-Char produced. Also various forms of organic waste can be converted to biochar. When organic waste is used to make E-Char a double carbon saving is created. For example, often times when agricultural waste is left to rot, it produces methane, a greenhouse gas 20 times more powerful than carbon dioxide. By quickly converting agricultural waste to E-Char (biochar) this eliminates the production of methane and the biochar can be buried in the topsoil where it will be stable and safely stored for thousands of years. Therefore, **NewEarth's EPT technology is a very important and useful tool for managing, recycling, and farming carbon.**

Studies of charcoal from natural fires and ancient anthropogenic activities indicate millennial-scale stability, which the terra preta soils in the Amazon Basin have proven from modern analysis. These black carbon rich soils were made more than 2,500 – and perhaps as long as 6,000 – years ago by the people living in that area. The biochar or organic carbon is still stable today after thousands of years.

7. What are the agronomic benefits?

A number of scientific studies have been conducted where biochar applications have shown significant agronomic benefits. These scientific field tests show generally better seed germination (30% enhancement), shoot heights (24%), and biomass production (13%), as well as crop yield increase by as much as 200% in some crops upon higher biochar additions to the topsoil.

8. What are the environmental and societal benefits?

Higher crop yields resulting from the use of NewEarth's E-Char are environmentally sustainable, and would mitigate pressures on the use of land worldwide, where a number of indigenous people engage in the environmentally destructive practices of clearing forest due to the demand for more arable land. As the worldwide population continues to increase, this will only mean more demand for arable land. By using E-Char degraded land could be restored to health, and existing arable land could be improved, decreasing the need for more land and destroying forest. Other environmental benefits using NewEarth's EPT technology and E-Char include waste management and recycling, which would avoid the creation of more landfills, offsetting the use of fossil fuels through renewable energy and renewable fuel production, stopping soil erosion, carbon sequestration, reduced soil emissions of non-CO2 GHGs, while improving crop performance and biomass production. All of these are huge benefits to our planet and all of its inhabitants!

9. How to get NewEarth E-Char?

There are 4 ways that your company can get E-Char.

- **Long and short term supply contracts for E-Char: NewEarth creates E-Char at its centralized factories and ships E-Char to its customers.**
- **Agricultural Recycling Partnerships: NewEarth takes the agricultural waste of its partners and converts it to E-Char. This is done at the site of the agricultural project using our mobile EPT units.**
- **Special Design Partnerships: NewEarth will design EPT projects to produce E-Char for its partners to fit their annual volume needs.**
- **Also E-Char is offered in 20lbs bags for the public consumer**

NewEarth is currently developing global partnerships with various companies to produce E-Char.

10. How can E-Char benefit your company?

By utilizing E-Char our customers can improve their soil conditions and increase their crop production yields by as much as 200% in some crops, while reducing the cost and resources used traditionally associated with higher crop yields. More production usually means more harmful use of harsh fertilizers and agricultural practices, but with E-Char your company can achieve its goals in the most environmentally conscious way. In addition to that, E-Char will also help its user to offset their carbon footprint, demonstrating their commitments to the health of our planet and the environment. Corporate responsibility and stewardship of the Earth will define all companies in a growing environmentally conscious world. E-Char will help any company to achieve a healthy triple bottom line of financial, social, and environmental success at a minimal cost.

