WHY MODERN FARMING IS THE BEST WAY TO SOLVE GLOBAL WARMING

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Editors Introduction: *Global climate change (formerly known as global warming* (https://www.tfp.org/global-warming-stopped-16-years-ago/)*) is a rallying point for the left. The culprit is carbon dioxide that must be regulated and controlled. In this article, Mr. Evaristo Eduardo de Miranda, a Brazilian expert in agriculture, ecology, environment and land management, suggests a solution that is both far less intrusive and far more effective: modern agriculture. The following article highlights five things that Embrapa's (short for* ***Em****presa* ***Bra****sileira de* ***P****esquisa* ***A****gropecuária, a research corporation owned by the Brazilian Government) research shows will reduce the production of such "greenhouse gases".*

In the hysteria over greenhouse gases and global climate change, the public has two concerns: 1) how to reduce emissions and 2) how to remove "excess" carbon dioxide from the atmosphere. New Brazilian agricultural techniques offer several paths to achieving these goals.

Sugarcane

The first path is to promote the production of sugarcane, currently grown on over 12.4 million acres in Brazil. A single acre of sugarcane removes more than 20 tons of carbon from the atmosphere. A comparable acre of annual crops or pastureland typically removes less than one-tenth that amount.

The amount of carbon drawn from the atmosphere by growing sugarcane is enormous. *Embrapa's* studies find that millions of tons of carbon are removed through the expansion of sugarcane production alone, producing an anti-greenhouse effect.

Sugarcane also produces ethanol, a renewable fuel that replaces gasoline and thus reduces carbon emissions from fossil fuels. In addition, many sugar mills use their boilers to generate electricity. Co-generation produces carbon credits and more than 500 MWh (Megawatt-hours). This bioelectricity enters the power grid in the dry season when rivers have less water for hydroelectric production and normal fuel-burning thermoelectric plants are more necessary. The sugarcane-generated electricity thus reduces the burning of fossil gas purchased from Bolivia.

This bioenergy can be expanded to meet 15% of the country's demand at competitive costs. Finally, there are advantages achieved through chemical production. Many companies already produce biodegradable plastics from alcohol, such as PHB (polyhydroxybutyrate). In the future, such chemical innovations will produce replacements for polyethylene, polypropylene and styrofoam that are now used for the manufacture of objects for the food, cosmetics, and pharmaceutical industries. These new products will also have uses in the construction industries.

Reforestation

Reforestation, planting new forests in deforested areas, is the second major area of consideration. Forests products produce charcoal, which is fundamental to the steel industry. About 80% of Brazilian charcoal now comes from reforested areas. These areas also provide wood for bakeries to make bread, for pizzerias and for kilns to make ceramics and pottery.

All this is renewable energy, which also removes carbon from the air. Trees actually store solar energy. Once cut down, they grow back and remove the carbon that is released by burning wood and charcoal.

Other reforestation projects guarantee the production of more than 6 million tons of paper and cellulose per year. Such uses always remove carbon from the atmosphere. Planting and producing timber also stores a lot of carbon found in beams and pillars, furniture and fixtures, doors and windows. Wood products store carbon… indefinitely.

Modern agricultural practices and the planting of native forests also aid the recovery rate of forests and hillsides near rivers. This recovery silently removes much carbon from the atmosphere. Additionally, the replenishment of forest reserves also enables operators to obtain carbon credits from the Clean Development Mechanism (CDM)[1] (https://www.tfp.org/why-modern-farming-is-the-best-way-to-solve-global-warming/#easy-footnote-bottom-1-58014).

Biofuels

The third contribution from agriculture is the substitution of petroleum products with Biodiesel, H-Diesel and Green Diesel. Vegetable oils are mixed with diesel, thus reducing the need for more fossil fuel.

By using a 5% blend of these biological oils, Brazil has reduced imports of diesel fuel by over 600 million gallons a year. H-Diesel, obtained from soybeans, castor bean and palm trees reduces Brazil's dependence on imported diesel by six to eight hundred thousand gallons a day, the equivalent of 1 million tons of oil. *Embrapa* has developed small machines to transform vegetable oils into Green Diesel in rural areas for agricultural uses. Such oils could be exported to Europe for use as biodiesel, helping to reduce greenhouse

gases throughout the planet.

New Techniques

The fourth contribution is found in the development of new agricultural techniques. The largest burning of fossil fuel in agriculture – 40-50% of the emissions – occurs when plowing the soil. Direct tillage without plowing greatly reduces emissions while avoiding soil erosion and prolonging the useful lives of tractors. Developed in Brazil over the last fifteen years, no-till farming[2] (https://www.tfp.org/why-modern-farming-is-the-best-way-to-solve-global-warming/#easy-footnote-bottom-2-58014) has already been implemented over approximately 120 million acres.

Harvesting green sugarcane without the usual burning of the leaves reduces the need for oil-derived herbicides, normally used to dry out the cane before harvest. Green fertilizers and the introduction of nitrogen-fixing bacteria from the air into the soil reduce the need for chemical fertilizers. Organic farming promotes the integrated control of pesticides, which also limits the need derived from petroleum-derived products like fertilizers.

Agricultural research is finding new ways to increase energy efficiency. These range from faster methods of cooking beans to eliminating the use of fire in agriculture. Modern agriculture has reduced burning in areas in the states of Mato Grosso, Maranhão and Goiás by fifty percent.

Biotechnology

The fifth contribution is many advances in biotechnology. Today's corn contains more carbon per acre than ten years ago. This is also true for many crops. Transgenic research has produced plants that are more resistant to pests and diseases, more adapted to the environment (https://www.tfp.org/environmentalist-psychosis-interview-with-prince-bertrand-d-orleans-and-braganza/) and have less need of petroleum-derived products.

Embrapa satellite monitoring project is mapping out and quantifying the complex withdrawals, stocks and emissions of atmospheric carbon by Brazilian agriculture. If agriculture still emits greenhouse gases, especially in relatively primitive and low-tech regions, modern agricultural technique are much more a solution than a concern when it comes to global climate change (https://www.tfp.org/bush-macron-and-the-monumental-failure-of-climate-politics/).

Footnotes

This is an initiative of the Brazilian government in response to the Kyoto Protocols.

No-till *farming*(also called zero tillage or direct drilling) is a way of growing crops or pasture from year to year without disturbing the soil through tillage.

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Is an agronomist and has a master's degree and a doctorate in ecology from the University of Montpellier (France). He is the author of 40 books and of hundreds of works published in Brazil and abroad. As a researcher at Embrapa (Brazilian Agricultural

Research Corporation), he has already implemented and directed three national research centers. He is currently the General Manager of Embrapa Territorial.

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