Sugarcane Agroecological Zoning

To expand production, preserve life, and ensure a future.

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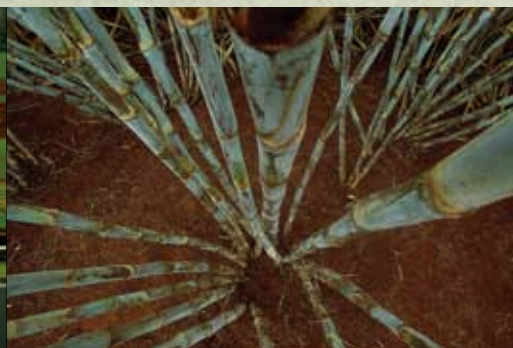
A NEW TIME HAS COME FOR SUGAR AND ETHANOL PRODUCTION IN BRAZIL.

Brazil has the most successful program for the substitution of fossil fuels with renewable fuels. Therefore, the Brazilian biofuels production is considered a world reference. Our production uses high level national technology. All equipment used in the sugar mills and distilleries, as well as the machinery used to harvest, are produced and developed in Brazil. The national technological research excellence has already resulted in accomplishments, such as the use of production waste and the re-use of water employed in the productive processes.

In addition to the technological potential, Brazil also has much land available for production. Today, we are the worlds largest sugar producer and exporter and the second largest ethanol producer, using less than 1% of the national territory. However, for Brazil, growth is not the only important goal; it is necessary to grow with sustainability, preserving nature. Brazil can produce more and better. Having that in mind, the Federal Government is launching the Sugarcane Agroecological Zoning *(ZAE Cana)*.



SUGARCANE AGROECOLOGICAL ZONING
(ZAE CANA)

The Agroecological Zoning is a thorough study of the Brazilian regions weather and soil that has innovated by taking into account environmental, economic and social aspects to guide the sustainable expansion of the sugarcane production and the investments on the sugar and ethanol sectors.

This pioneer work addresses the need to discipline the expansion of cane production vis-à-vis the increasing world demand for biofuels and the intention of national and transnational companies to invest in the Brazilian ethanol production.

The objective of *ZAE Cana* is to give orientation to the future of biofuels production in the country, allowing a balanced, sustainable growth of sugarcane production.

Hence, the Federal Government has referred a bill to the Congress setting rules and guidelines for the expansion of sugar cane production. It also established new rules for the concession of credit to the sector.

Today, Brazil has the greatest biodiversity in the planet, one of the worlds largest reserves of agricultural lands, and the most advanced technologies for agriculture in tropical areas. In this context, *ZAE Cana* gives strong conditions to secure harmony among food, energy and ethanol production, and the environment.

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RULES TO GUIDE THE EXPANSION OF SUGARCANE PRODUCTION

To make the mapping of the national territory, the following guidelines have been set:

Exclusion of areas with native vegetation

As soon as the law is approved, it will be prohibited in the entire national territory to remove native vegetation for the expansion of sugarcane cultivation. Areas in which native vegetation is dominant will be protected, as they are considered restricted areas, and sugarcane cultivation will not be permitted.

Exclusion of areas for cultivation in the Amazon and Pantanal biomes, and in the Upper Paraguay River Basin

ZAE Cana prohibits the expansion of sugarcane production in the Amazon and Pantanal biomes, and in the Upper Paraguay River Basin. To protect the environment, preserve the biodiversity and make use of the natural resources in a rational manner, the installation of new units of ethanol production will not be permitted on these locations.

Identification of areas with agricultural potential without need of full irrigation

ZAE Cane has considered weather and soil conditions, and varieties of sugarcane to select areas in which sugarcane production uses the lowest volume of water possible.

Identification of areas with slope below 12%

Areas with slope up to 12% allow the use of machinery on the harvesting. Therefore, an expansion of production environmentally adequate can be guaranteed, avoiding new burnings and CO^2 emission. With mechanical harvesting, the expansion will happen with no need for sugarcane manual cutting.

Respect for food security

The Bill provides that the Ministry of Agriculture will guide the expansion of sugarcane production so as to avoid any sort of risk to food production or to food security.

Prioritization of degraded areas or pasture

ZAE Cana is an important tool to guide public policies and credit policies in a way to give priority to sugarcane expansion in areas already used as pasture. Over 34 million hectares of land currently underutilized or occupied by livestock or degraded pastures are identified in ZAE as suitable for sugarcane production. The increase in the livestock productivity in Brazil (head of cattle per hectare), which today is considered as being low, may provide new areas for sugarcane production.

These measures combined compose *ZAE Cana*.

Nowadays, sugarcane cultivation uses less than 1% of the Brazilian lands (7.8 million hectares). Projections of the Ministry of Agriculture indicate that if Brazilian production doubles till 2017, at most 1.7% of the lands will be used.
The group of restrictions regarding the environment, economy, society, climate risks, and soil conditions, set by *ZAE Cana*, guides the expansion of Sugarcane in 7.5% of the Brazilian lands (64.7 million hectares). According to the new criteria, 92.5% of the national territory is not suitable for sugarcane plantation.

This is the way towards sustainability.

ZAE CANA IN BRAZIL – SUMMARY TABLE

TERRITORY OR ESTIMATED AREA	MILLION (ha)	PERCENTAGE IN RELATION TO THE NATIONAL TERRITORY
National territory (IBGE)[1]	851.5	100%
Agricultural lands	553.5	65%
Land in use 2002 (Probio Estimate)[2]	235.5	27.70%
Environmentally restricted areas (including the Amazon and Pantanal biomes, and Paraguay River Basin)	694.1	81.50%
Suitable areas that are currently being used for agricultural and livestock production	64.7	7.5%
Suitable areas that are currently being used for pasture (high and average suitability)	34.2	4.02%
Area currently cultivated with sugarcane 2008/2009 harvest[3]	7.8	0.90%
Expansion of sugarcane production foreseen for 2017[4] (EPE)	6.7	0.80%

[1] – IBGE - Brazilian Institute of Geography and Statistics
[2] – PROBIO – Activity of the Program for Conservation and Sustainable Use of the Brazilian Biological Diversity
[3] – Source: Conab, 2009.
[4] – Adapted from the Energy Research Company (EPE) estimate, 2008.

ZAE IS NOT APPLIED TO UNITS ALREADY OPERATING

The rules of Sugarcane Agroecological Zoning are not applied to industrial units already installed, the cane produced for their supply, or their planned expansion. Neither is *ZAE Cana* applied to units with environmental licensing.

Brazil

Sugarcane Agroecological Zoning

BRAZIL	CLASSES OF SUITABILITY	SUITABLE AREAS GIVEN TYPE OF LAND USE BY CLASS OF SUITABILITY (ha)				
		Al	Ag	Ac	Al + Ag	Al + Ag + Ac
TOTAL AREAS FOR BRAZIL	High (H)	11.3 million	600 thousand	7.3 million	11.9 million	19.2 million
	Medium (M)	22.8 million	2.01 million	16.3 million	24.8 million	41.2 million
	Low (L)	3.04 million	483 thousand	731 thousand	3.5 million	4.2 million
	H + M	34.1 million	2.6 million	23.7 million	36.7 million	60.4 million
	H + M + L	37.2 million	3.09 million	24.4 million	40.3 million	64.7 million

Caption:

Al: areas used with livestock
Ag: areas used with agriculture and livestock
Ac: areas used with agriculture

Roraima
Amapá
Amazonas
Pará
Maranhão
Ceará
Piauí
Acre
Rondônia
Tocantins
Mato Grosso
Bahia
Brasília
Goiás
Minas Gerais
Mato Grosso do Sul
São Paulo
Paraná
Santa Catarina
Rio Grande do Sul
Caption:
Suitable areas
Upper Paraguay River Basin and Amazon and Pantanal biomes

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ZAE Cana will allow Brazil to continue growing without giving its natural wealth up. The criteria and guidelines adopted represent a strict control over the expansion of sugarcane cultivation in the country.

The suitable areas are more than enough to meet the future demand for ethanol and sugar in the domestic and international markets foreseen for the next decades. In addition, Brazil invests on the development of technologies for second generation ethanol production. The use of new technologies for ethanol production, such as the hydrolysis of bagasse resulted from crushing the sugarcane, will make it possible to raise in up to 80% the biofuel production in each hectare. Production will increase without altering the cultivated area.

With the knowledge and experience acquired from more than 30 years of a successful program, the ongoing use of high technology, and the improvement of its public policies, Brazil will produce sugar and ethanol preserving its unique characteristics, contributing to its people well being, and to the environment in the whole planet. Upon these strongly structured grounds we are seeding a great future in an innovative and sustainable way.

End of Burnings

Besides regulating the future expansion of sugarcane, the Federal Government is proposing the end of burnings in the already existing areas of production according to a schedule of transition. Current production must be adapted till 2017. **With this initiative, it is prohibited the use of burning in areas suitable for mechanical harvesting, which are those above 150 hectares wide with slope equal or below 12%.**

This measure will allow the reduction in greenhouse gas emissions in a volume equivalent to six million tons of CO^2 considering 2008 as a reference year. **This means that Brazil will avoid annual emissions of CO^2 similar to those caused by 2.2 million light vehicles.**

Year	Percentage of elimination of Burning
2012	20% of the harvested area
2014	40% of the harvested area
2017	100% of the harvested area

More information at www.cnps.embrapa.br

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