

## Law for the Prohibition of the Burning of Sugar Cane in Mexico

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### Abstract

In spite of the economic, social, industrial and food importance that the sugar industry represents in our country, sugar mills are highly polluting of the environment due to the obsolete processes that are still used today from field work to agriculture. manufacturing processes of the sugar bean. The need arises to address this issue in order to achieve alternatives that provide sustainable solutions for this current problem.

In this paper we propose Law for the Prohibition of the burning of sugar cane in Mexico. Therefore, in Mexico, a law should be promoted to prohibit the burning of sugar cane due to the advantages that this action offers for the country, for the metal-mechanic industry, and for the inhabitants by reducing pollution and increasing employment. In order to eliminate it, the mechanization of the green harvest must be promoted, encouraging the design, manufacture and testing of mechanized sugarcane harvesters.

**Keywords:** Burning of Sugar Cane; Mexico, Sugar Cane Harvesters; Sugar Cane Harvesting

### Introduction

Agroindustry of sugarcane is an activity that has been an important source of income for Mexico for five centuries. It is a crop whose processing requires a lot of labor, so it represents a relevant source of employment. On the other hand, the consumption of sugar per capita has increased by 45.6% since 1970, we consume between 42 and 52 kilos of sugar per year, the preliminary figure for the closure of sugarcane production 2018, which amounted to 55.9 million tons, according to the report of the advance of plantings and harvests to the month of July of 2018 The main producing states were Veracruz (37.5%) and Jalisco (13.1%), which together contributed 28.3 million tons; that is, 50.6% of the national total [1]. In spite of the economic, social, industrial and food importance that the sugar industry represents in our country, sugar mills are highly polluting of the environment due to the obsolete processes that are still used today from field work to agriculture. manufacturing processes of the sugar bean. The need arises to address this issue in order to achieve alternatives that provide sustainable solutions for this current problem [2]. The objective is to highlight the importance of the prohibition of the burning of sugarcane for Mexico.

In this paper we propose Law for the Prohibition of the burning of sugar cane in Mexico.

### Results

The burning of the cane fields predominates in the harvest of both manual and mechanical sugar cane. This burning technique generates environmental, economic, technological and social problems, so it is urgent to promote the "raw" cane harvest and simultaneously introduce technologies and methodologies for the profitable and sustainable management and use of crop residues. In the few areas of mechanized total harvesting of "raw" cane, the residues represent up to 26% of the equivalent yield of cane, although its total elimination persists due to burning after harvesting and, little volume is collected and used as forage. Due to the above, it is important that agronomic practices are carried out considering the needs of the raw cane harvest, both manual and mechanical, since agronomic practices contrary to this purpose can not be excluded, only by improving the design of the harvester or the harvesting practices. It is concluded that the implementation of the green cane harvest has the potential to reduce the impact of the burning of cane fields on the environment, public health and the living conditions of the inhabitants who suffer from the effects of smoke and ashes generated by burning.

Advantage burned cane	Disadvantage burned cane	Advantage green cane	Disadvantage green cane
Remove dry foliage to facilitate access by cutters and protect them from the attack of any wildlife	Soil degradation	Greater performance and cost reduction	Eliminates human labor
Facilitates the harvest by eliminating the excessive foliage of sugarcane	Increase emissions and the impact on the environment	Develop new technologies	Increases the possibility of poisonous fauna bites
Generates jobs for unskilled labor	Decrease productivity	Advance in the productivity and profitability of this agro-industry	High initial cost for the investment of equipment not manufactured in the country
	Increases the proliferation of diseases of cane cutters and the surrounding population	Make the harvest more efficient optimum the cane to the mill; making the transport operation, minimizing impacts negative to the environment and contributing to productivity of the mills,	It produces increase of strange matter
	Eliminates the surrounding fauna and inside the reedbed	Reduces emissions smoke and ash contaminants to the environment, lessens the aspiration of these fumes by workers dedicated to the harvest and that are pending the burning, and impacts in a lesser way the fauna that develops in and around the cane fields	Decreases Brix, Pol and the purity of sugarcane juice
		Losses of sucrose are reduced by burning	The efficiency in the extraction is reduced
		Promotes the development of the agricultural machinery industry to lower procurement costs and generates employment in the agricultural machinery industry	

**Table 1:** Advantages and disadvantages of the green or burnt sugar cane harvest Fuente. Subiros [3]. Negrete [4].

Several advantages of the harvest of green cane have been achieved in sugar extraction operations of the mill, among which can be mentioned; higher sugar recovery per unit area of land, better management of harvesting operations and a reduction in the number of transport units. Among the main disadvantages, there is a greater amount of undesirable matter (straw) in the cane harvested, higher concentration of waxes, ashes, polysaccharides and starches in the juice extracted, increase in the amount of molasses, increase in sugar losses by ton of cane and decrease in grinding capacity, resulting in an increase in the cost per unit of sugar produced and a greater concentration of color in the Ortiz juice [5].

In practically the entire sugar world the plant is burned to harvest commercial plantations, In Cuba, Australia, South Africa and some regions of Brazil, sugarcane harvesting takes place completely without burning is done in green. There are also other traditional cane producing areas such as Hawaii and Colombia where the practice is regulated. In those countries and localities where the production of cane and sugar is operated following the philosophical and pragmatic Principles of Organic Agriculture, obviously the burning does not apply; this is the case of Paraguay, Brazil, the Dominican Republic and Colombia, mainly, among many other countries that develop this interesting commercial option with different intensity. The countries that have eliminated the

burning, as is the case in Australia, must be partially recognized, they have been motivated more for economic reasons than environmental reasons. In Hawaii there has been a huge pressure against burning, for a long time, promoted mainly by the tourism sector that has considered burning as a practice that undermines the panoramic and scenic riches of the place, affecting the place as a tourist destination [6].

Colombia has tried to solve the problem of burning without damaging its structure and basic production system, by virtue of the high tonnages of sugarcane that it produces (superior on average to 123 MT/ha) and the difficulties that consequently are generated for mechanical harvesting, not to burn their commercial plantations, thus affecting their profitability and technical-economic competitiveness. Due to the large amount of raw material produced and needed to be cut, the harvesting machines see their cutting capacity severely limited as the plantation is not burned, due to the impediment that the foreign material (dry and green leaves, bud, etc.) implies for the cutting and processing system.

In the particular case of Colombia, it was after 1973 that they began to practice the burning of sugarcane plantations, generating over the years great discontent for the environmental and health damage that it caused in the plantations. Thus, in 1995 the Colombian Ministry of the Environment, published a Decree (No. 948 of 1995) in which agricultural burns are prohibited as of 2005, forcing the Colombian sugar industry to propose technological strategies to meet this objective.

The sugar industry of Mexico does not establish any type of express prohibition to burn cane. The regulations are the common norms established for the burning of vegetable waste, so there is no type of prohibition for the practice of burning sugarcane.

In Brazil, a country in which the matter of burning sugarcane plantations there are regions such as the Center-South, properly in the States of São Paulo, Minas Gerais and others, where great efforts are made by the big sugar mills to eliminate the burning, which has been very successful in several regions and localities as happens for example in the town of Ribeirão Preto. In the Northeast, States of Pernambuco, Alagoas, Bahia and others, the practice of burning is widespread and entrenched among producers.

A plan to systematically eliminate burning is currently being implemented. Said Plan is duly defined and regulated in Law No. 11.241 sanctioned by the Governor of the State of Sao Paulo and published in the Official Gazette of the State of Sao Paulo (Volume 112, Number 180) on September 20, 2002.

## Conclusion

Therefore, in Mexico, a law should be promoted to prohibit the burning of sugar cane due to the advantages that this action offers for the country, for the metal-mechanic industry, and for the inhabitants by reducing pollution and increasing employment. In order to eliminate it, the mechanization of the green harvest must be promoted, encouraging the design, manufacture and testing of mechanized sugarcane harvesters.

- Article 1: It is prohibited the burning of sugar cane having to be implemented gradually.
- Article 2: The National Institute for the Mechanization of Sugar Cane will be created, where the development and design of machines for the mechanical harvesting of sugarcane will begin.
- Article 3: The establishment of assembly and manufacture of cane harvesters of foreign companies will be encouraged, granting them advantageous facilities.
- Article 4: Credits will be granted for the importation of cane harvesting machines from all over the world, previously tested and authorized by the Institute for the mechanization of sugarcane.
- Article 5: Companies that commercialize cane harvesting machines must commit to maintain a stock of spare parts for at least 10 years.

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