Environmental Impacts of the Changes in US – Mexico Corn Trade Under NAFTA

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Summary:

This study explores the environmental impacts of the changes in the US-Mexico corn trade under NAFTA. Since 1994, US corn exports to Mexico have increased by about 2 million tons per year – roughly 1% of US production, or 10% of Mexico's consumption.

In the US, the increase in exports brings economic and social benefits, but also increases in several types of environmental costs. Increased exports to Mexico could be said to be responsible for 1% of these impacts, with one exception noted below. Fertilizer use is high and slightly increasing (per hectare); runoff of excess fertilizer leads to elevated nitrogen levels and hypoxia in waterways, most dramatically including the appearance of a large "dead zone" in the Gulf of Mexico. Use of potentially toxic pesticides is declining (per hectare) but still high. Unsustainable use of groundwater for irrigation is problematical in some corn-growing states.

The rapid introduction of Bt corn during 1996-99, a major factor in the reduced use of insecticides, has uncertain long-term implications and poses threats to biodiversity in both the US and Mexico. Bt corn has been rejected in some major export markets, but not in Mexico; that is to say, sales to Mexico account for more than 1% of the available market for transgenic corn. Bt corn is expensive, and appears to be profitable only in the worst years and/or worst areas of corn borer infestation, particularly in the very dry, irrigation-dependent areas where corn borers thrive.

Impacts of Mexico's increased corn imports have been examined in studies by Alejandro Nadal for CEC, and by others. This study focuses on a statistical investigation of market forces and their implications for genetic diversity, using data on technology and production by state. Genetic diversity is preserved in practice by traditional styles of cultivation in the less modern, generally southern states. Market forces did not reduce genetic diversity by reducing output in the traditional states after 1994; in fact, output in key southern states continued to rise despite sharp cutbacks in more modern, northern states. However, yields continued to rise throughout the country, in both traditional and modern states. If these yield gains resulted from an increased use of improved seed varieties, there is a danger that genetic diversity is steadily being lost to modernization of production. More detailed research is needed on the evolving maize cultivation practices in the traditional areas of Mexico.