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Potential impacts of imposing methyl bromide phaseout on US strawberry growers: a case study of a nomination for a critical use exemption under the Montreal Protocol

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Abstract

The Montreal Protocol on Substances that Deplete the Ozone Layer requires developed countries to phaseout methyl bromide production and non-quarantine uses by 2005 and developing countries to do the same by 2015. Exemptions to phaseout have been significant in slowing the process of abatement; many countries have applied for exemptions for some uses, partly on grounds that phaseout is economically infeasible. Data on the US strawberry market are used to investigate grower costs arising from substitution away from methyl bromide, the impact of trends in and characteristics of the demand for fresh strawberries, and characteristics of trade with countries not yet required to eliminate use of the compound. It appears that actual net costs to growers will be much smaller than the simple increase in production costs cited in the US nomination for exemption.

Keywords: Methyl bromide; Montreal Protocol; Ozone layer; Strawberries

1. Introduction and background

The Montreal Protocol on Substances that Deplete the Ozone Layer has been the most successful international environmental agreement ever reached, but issues around the elimination of methyl bromide (MeBr) have proven difficult to resolve at recent meetings of the Parties to the Protocol and the associated committees, with temporary agreements being renegotiated at each meeting in the absence of a consensus path to full elimination of the compound. While MeBr is only one of many substances being phased out under the Protocol, it has so far been the most controversial; the provisional agenda of the First Extraordinary Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, in March 2004, was almost wholly devoted to the assessment of requests for 'Critical Use Exemptions' (CUEs) from MeBr phaseout (UNEP, 2004). The MeBr phaseout had also been an intractable problem at the Fifteenth Meeting of The Parties in November 2003. Understanding the economic impact of continued phaseout is critical to assessing the exemption requests. These requests are evaluated by the Parties (and specifically the Methyl Bromide Technical Options Committee) using several criteria, one of which is 'economic feasibility'—the precise determination of which is not specified in the legal framework of the Protocol.

Methyl bromide is a toxic chemical pesticide that depletes the earth's protective ozone layer but which also serves as a soil-sterilizing agent for farmers, among other uses. Strawberry farmers are among users fearing significant losses and even farm failures without the continued availability of methyl bromide as a fumigant. Some US farmers and their representatives contend that elimination of MeBr will raise costs in agricultural

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sectors that are on a knife-edge of profitability,[1] and could move significant amounts of strawberry production for US markets to Mexico, where the Montreal Protocol permits use of the compound for several more years and where alternative methods of pest control are more widely used. The US nomination for field production of strawberries alone comprises about 15% of the total requests for exemptions from all Parties to the Protocol received in 2003, and the US aggregate exemption for 2005 (granted in 2004 and allowing US consumption to rise to 35% of 1991 levels) (Eilperin, 2004) accounts for two-thirds of global exemptions granted. The progress of MeBr phaseout in US strawberry production is important to the ongoing success of the phaseout on a global scale. Further, this case study may provide insight into the economic circumstances of phaseout in other countries and commodities.

This paper provides evidence about the economic burdens associated with phaseout and insight into the factors affecting phaseout costs by focusing on the particular case of fresh field strawberries in the United States and evaluating costs borne by consumers and growers in the US strawberry market if phaseout takes place without granting exemptions and in the absence of additional public support to growers. We find that competition from Mexico, the primary source of imported fresh strawberries in the US market, will be limited by several factors, that US demand for strawberries can be expected to remain strong in the face of price increases due to strong income elasticity and limited price responsiveness, and that much of any cost increase will be passed onto consumers rather than borne by producers. The analysis presented here illuminates some of the questions around the nature of 'economic feasibility' in one important market; similar analysis could be applied to many of the other exemption requests.

2. Data and descriptive information about the US strawberry market

Comprehensive data on strawberry supply, trade, prices and consumption patterns can be found in the 2003 *Fruit and Tree Nuts Situation and Outlook Yearbook* (FTS), compiled and published by the Economic Research Service of the USDA. This information is from a variety of US government departments. Additional information is from the US Census Bureau, the Bureau of Labor Statistics, from sample enterprise budgets for strawberry production in various regions published by the University of California Cooperative Extension, and from the Critical Use Nominations submitted to the Secretariat of the Montreal Protocol.

Table 1
Characteristics of the US strawberry market

	2002	Change, 1980–2002
Average consumption per capita, fresh	2.22 kg	+145%
Average consumption per capita, frozen	0.77 kg	+42%
Total consumption, fresh	646,460 T m	+218%
Total consumption, frozen	222,222 T m	+79%
Total production, fresh	676,851 T m	+210%
Total production, processed[a]	216,817 T m	+118%
Real grower receipts per kilogram, fresh	$1.57	−33%
Real grower receipts per kilogram, processed[a]	$0.73	−45%
Grower receipts per average consumer (all)	$4.05	+45%

Data are from FTS 2003, tables A-1, D-8 and F-10 and author's calculations.

[a] Most but not all processed strawberries are frozen.

Table 1 provides some of the details of the US strawberry market at present and the general trends over the years for which information is available. All money figures here and throughout (unless otherwise specified) are converted from nominal dollars to real 2002 dollars using the annual US Consumer Price Index. (US Department of Labor, 2003).

In both fresh and processed markets, per capita consumption has grown faster than grower prices have fallen. Over the same period, the number of consumers has risen; US population growth averages just over 1% annually, so total increases are even larger.

3. Potential impacts of trade with MeBr using countries

The US is a net exporter of fresh strawberries, producing about 30,400 tonnes more than was consumed domestically in 2002. US exports are 10.5% of production (FTS 2003, F-10), while imports are 6.3% of consumption, up from 2.8% in 1980; part of the increase reflects increased availability prior to and after the peak of the US growing season. The majority of imports (about 97%) are from Mexico. Exports are reported at a coarser level; the US exports 109,042 tonnes of fresh berries, three quarters to Canada (FTS 2003, G-1, G-2); of these exports, 71,164 tonnes are fresh strawberries (FTS 2003, G-6).

Since fresh berries are perishable, highway and train transport is only feasible within North America. Exports to (and imports from) more distant markets tend to be a small part of US sales as a result of the high cost of air transport and competition from production nearer those markets. Even with rail and truck transit, the price in an export market must be significantly higher than in the domestic market to justify the expense and risk associated with

[1] However, the Fruit and Tree Nuts Situation and Outlook Yearbook (2003) describes the current cost and profit situation in US strawberry production as robust, reporting that 'In response to strong demand…strawberry production has been increasing…and growers received their highest returns in 2002.'