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**“Economic Impacts of GM Soybean Adoption in Brazil”**

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**ABSTRACT**

Herbicide tolerant soybeans have been rapidly adopted by Brazilian farmers, yet government approval for commercialization has been on hold since 1998, with only “Provisional Measures” in the past two years to guarantee the marketing of existing of genetically modified (GM) soybeans in the country. Despite the fact that it is forbidden, Brazilian producers in several regions, are planting GM soybean seeds. Brazilian growers are planting GM seeds because they can rely on a single application of Roundup to control a broad spectrum of both broadleaf and grass weeds without injuring their soybean plants or having to rotate acreage into other less profitable crops.

To understand why Brazilian farmers are adopting GM soybeans (legally or not) we seek to estimate realized and potential impacts of adoption in Brazil, including changes in yield, production costs, and pesticide use. We also analyze the trade impacts of Brazilian GM soybean adoption using USDA/ERS’ Brazilian country model incorporating detailed costs of production data for soybean producing regions in Brazil. These results are incorporated into a global model to determine price and worldwide supply/demand impacts.

Preliminary results indicate that GM soybean adoption will result in reduced chemical costs, boosting Brazilian producers’ profitability, leading to increased plantings, output and ultimately Brazilian exports. GM adoption may reduce production costs by 12

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percent (despite higher seed costs), and reduce use of other chemicals by 67 percent. The economic advantage for Brazilian farmers who plant GM soybeans was an estimated US\$1 billion over ten years and include savings of \$196 million annually in weed control costs and 9 million fewer soybean herbicide applications per year. In fact, if Brazil's producers shift completely to biotech varieties, we estimate that Brazilian soybean exports will increase by an average of 3.4 million tons (or 9.3 percent) over current baseline estimates through 2015. By increasing global supplies of soybeans, global competitors' farm prices, export levels, farm income and government outlays will be affected – not just for soybeans but for competing crops as well due to substitution effects.

GM crops can contribute to substantial progress in improving agriculture in Brazil, where issues of food security and agricultural development press hard. In the case of Brazil, that includes an already low cost producer becoming even more competitive through its adoption of a cost-saving technology. In tomorrow's global marketplace, which will become less distorted in the years ahead, the biggest beneficiaries will be those with the lowest production costs. Brazil's decision to embrace biotechnology can only help ensure they will be among its biggest winners. GM soybean varieties with increased oil content will also provide greater energy intake for beef, swine, and poultry. It is unlikely that continuing with a "one year's -off" solution for GM soybeans will put an end to the biotech crop polemic in Brazil. The constant vigilance required by the authorities to detect transgenic crops and prevent the national grain-storage system from mixing the two kinds of soybeans, and to crack down on the smuggling of seeds, will be too large a task.