Chapter 6

Assessment of Social and Cultural Effects Associated with Transgenic Maize Production

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Abstract

Social impact assessment

The introduction of transgenic maize into Mexico typifies a technology whose impact will not be confined to a specific social group or geographic region. Impacts might include declines in income or the availability of food, loss of relative economic or social position, and loss of agricultural assets that are part of cultural identity.

Social structure of Mexican maize agriculture

Maize production varies across ecological regions, cultures, and socio-economic groups. Producers divide into non-commercial, semi-commercial, and commercial farm types. The non-commercial and semi-commercial sectors comprise 60 percent of the production units, utilize 33 percent of the maize area, and produce 37 percent of the national production of the grain. Although small farms are oriented toward producing for home consumption, their production is often insufficient to meet household needs, and they must purchase maize for consumption.

Technological change in Mexican maize production

The modernization of Mexican agriculture has been accompanied by a relatively weak system of agricultural extension and other technology transfer mechanisms, especially to non-commercial and semi-commercial producers. Nevertheless, there have been important developments in technical assistance to the small farm sector. Mexico has experienced profound economic changes since trade liberalization was initiated in the mid-1980s. The economic reforms within the globalization framework are widely viewed as reversing trends towards social equity. The effects of trade liberalization have been to deepen the crisis in the agricultural sector and to prompt many rural people to seek off-farm employment.

The difference in variety choice between the non-commercial and semi- commercial sectors and the commercial sector is not so much in criteria as in where to obtain seed. Three patterns summarize research on variety choice and seed selection: (1) a preference for local seed among non-commercial and semi-commercial producers, (2) careful selection of seed for local adaptability, and (3) relatively common use of seed that is acquired from other farms and villages. It is appropriate to describe Mexican maize agriculture among all types of producers as an “open system” because of the flow of seed, farmers’ efforts to acquire new traits, and their success at transferring traits from new varieties and types into local maize populations. Although the system is an open one, it is also conservative in terms of maintaining local populations.

The large majority of maize producers in Mexico has been exposed to new technology and can be described as partial adopters in two senses. First, new maize technology is rarely adopted as a "package" of inputs—seed of improved varieties, fertilizers, pesticides, irrigation, and mechanization. Second, new maize technology is adopted more extensively in commercial sector than among non-commercial and semi-commercial producers. However, no single matrix of socio-economic, environmental, and location-related factors can predict or explain the adoption of agricultural technology in the maize sector.

Social scientists are divided in their conclusions about bias in agricultural technology in Mexico. One group concludes that agricultural research and technology in the country have an urban-industrial bias that is unfavorable to the poor and to small producers. Another group finds that agricultural technology benefits peasant producers.

A serious consequence of promoting transgenic technology is the likelihood of a shift to private research and a decline in public funding and research for agricultural development directed to the poor.

Among farmers in the non-commercial and semi-commercial sectors, transgenic maize is likely to be met with the same attitudes of caution and conservatism as commercial hybrids and open pollinated varieties. Traits that are neutral to farmers may persist but at the low level at which they were introduced. Traits that are viewed negatively are likely to be eliminated. The transgenic traits that are currently present in maize (Bt and herbicide tolerance) may have some value to some Mexican farmers. Pests of maize that may be controlled by Bt (e.g., armyworms, earworms, rootworms) result in significant yield and quality losses annually in the country. Herbicide tolerant maize may have some value for farmers in all three maize sectors because of the possibility to reduce labor and/or herbicide costs.

Potential effects of transgenic maize

Provided that transgenic maize does not have drastic effects, such as causing unviable seed, yield reductions, or alteration in food quality, this maize per se should have no more effect on farmer choice and rights than previous maize improvement. Farmer attitudes and Mexican intellectual property laws facilitate the openness of the present maize system and farmer practices of incorporating new germplasm. Transgenic seeds should have no effect on traditional practices of seed exchange among farmers. It is doubtful whether transgenic maize production in Mexico will have a significant income effect in the context of a national market that is open to imported maize and no longer has government involvement in marketing grain.

Cultural importance is separable from agricultural importance based on "profitability," and there are different types of farmers with different cultivation practices and objectives. The diversity of maize and of the management and environmental conditions in which the grain is grown makes it impossible to unify a single technology for all maize farmers. Pressures on maize diversity have been present for many years, yet there is widespread conservation of traditional maize varieties. The current pressures on maize producers, especially poverty, an unfavorable economic and political environment and migration, pose greater and more immediate threats than transgenic maize does to maize diversity and to the local autonomy of production.