

has lost six similar cases so far, and hundreds more are pending (Cronin Fisk and Whittington 2010).

Rice futures prices eventually recovered, as energy costs and commodity speculation drove bidding to record highs in 2008. But LibertyLink was detected in subsequent shipments, preventing marketers from taking advantage of high prices and effectively restricting U.S. rice trade with the European Union (GAO 2008). California rice growers were largely unaffected by the LibertyLink incident, because they primarily grow short- and medium-grain rice (table 1). Only one

TABLE 1. Regulatory status and field-test locations for Bayer's LibertyLink (LL) rice

Variety	Grain type	Federal regulatory status*	Calif. certification status†	Field-trial locations
LL62	Medium	Approved 1999	Approved for greenhouse trial in 2008	La. (2); Puerto Rico (2); Calif.
LL06	Medium	Approved 1999	Not approved	Calif. (10); Puerto Rico (2)
LL601	Long	Approved 2006‡	Not approved	Ark., Miss., Mo., Texas, La., Puerto Rico
LL604	Long	Not approved	Not approved	Ark., Miss., Mo., Texas, La., Puerto Rico

* Includes Food and Drug Administration, Environmental Protection Agency and U.S. Department of Agriculture Animal and Plant Health Inspection Service. Federal approval does not automatically entail approval at the state level.
† State regulatory agencies include California Department of Food and Agriculture and California Rice Commission task force.
‡ Approval came after discovered mixed with nontransgenic rice varieties in southern United States.

Biosafety or trade barrier? Japan's tenuous trade with California

Japan is the California rice industry's largest international customer, purchasing more than \$421 million in 2009 — over 40% of the industry's exports (FAS 2010). If tests on imports find transgenic traits, Japan has suggested that it would deny rice shipments. Some observers question whether such policies are about biosafety or if they constitute a barrier to trade.

Rice is culturally, religiously and politically significant in Japan. Japan has invoked national food-security policies that promote self-sufficiency and smallholder paddy production (Ohnuki-Tierney 1993); nonetheless, it is a leading food importer, deriving about 40% of its total calories from imports (Sato 2007). Like California, Japan produces temperate, medium-grain japonica varieties. In Japan, however, per-acre production costs are 10 or more times higher, and consumer prices are two to three times higher than in California (Fukuda et al. 2003). Post-World War II land reforms divided rice-growing areas into holdings of less than 7 acres. In contrast with other food commodities, Japan is self-sufficient in rice production and tends to guard its domestic rice markets against imports.

During the 1994 Uruguay Round of international trade negotiations, Japan yielded to U.S. pressure and agreed to phase out rice import restrictions, reduce government subsidies and annually increase the amount of rice it imported. Japan is required to import more than 680,000 tons of rice per year (Fukuda et al. 2003). About 100,000 tons of this rice

is used in food and beverage manufacturing; the rest is directed to government warehouses for eventual re-exportation as foreign food aid (Fukuda et al. 2003). In 2006, Japan announced that the rice surpluses stored in government warehouses would also be used for bio-fuels (Annon 2006), and production commenced in 2009 (Takada 2009).

Japan's strict policies on transgenic rice are rooted in both concerns about biosafety and economic protectionism. The Cartagena Protocol on Biosafety — part of the United Nations Convention on Biodiversity — allows countries to base decisions about transgenic organisms on the precautionary principle. When risks from biotechnologies are severe and potentially irreversible, nations can implement labeling and other regulatory requirements. Codex Alimentarius, the international standards-setting organization for food safety, has developed guidelines for food derived from biotechnology (i.e., transgenic foods) and suggests labeling as an appropriate approach to risk management (Codex 2003). Both institutions seek to ensure that restrictions on trade are not rooted in protectionism and are informed by the best available information about food safety and environmental consequences.

Unfortunately for California rice growers, other foreign customers that also import japonica rice, such as Taiwan,



Turkey and South Korea, maintain rice import protocols similar to those of Japan. Both Taiwan and South Korea also have Uruguay Round commitments that are contradictory to the interests of domestic

rice farmers in those countries, and both have asserted strict import restrictions on transgenic rice. Turkey banned transgenic rice altogether. While it is difficult to determine whether protectionism, culture or biosafety are the main forces driving such policies, all play a role in influencing the deployment of transgenic rice.

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