Prospects for Chilean Agriculture Under NAFTA

by

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Introduction

In recent years, the United States has expressed interest in the establishment of a free trade agreement with Chile. Such an agreement would aim to reduce both tariff and nontariff barriers in order to encourage increased bilateral trade between the countries. In May of 1994, a bill known as the Chile Free Trade Negotiating Act was introduced to help foster formal negotiations over the admittance of Chile into the North American Free Trade Agreement (NAFTA). These negotiations began in 1995 and are still currently under way, although eventual admittance is by no means guaranteed.

In addition to affecting bilateral trade with the United States, formal admittance into NAFTA will also affect trade between Chile and the remaining member countries of NAFTA, however this paper focuses on bilateral issues between the United States and Chile. A significant part of U.S.-Chilean bilateral trade consists of agricultural products. As a result, two important questions arise: *i.)* what are the potential impacts of a free trade agreement on bilateral agricultural terms of trade; and *ii.)* what are the key factors that will determine the extent of these impacts? This paper will address these questions by providing an overview and analysis of Chilean agricultural structure, infrastructure, and idiosyncrasies followed by their expected effects on trade.

A quick overview of the agricultural balance of trade between Chile and the U.S. between 1991-1993 reveals that Chile exported on average roughly $630 million per year or approximately 40% of total Chilean agricultural exports to the U.S.. The majority of these exports consisted of fresh fruits and vegetables as well as forestry products. Chile imported

close to $70 million in agricultural products from the U.S., or about 14% of Chile's total agricultural imports. From the U.S. perspective, trade with Chile represents only a small fraction of total U.S. trade, thus making an agreement with Chile more important as a symbol of a U.S. commitment to free trade and western hemispheric integration than as a significant opportunity for expanding trade.

Previous Work

With the exception of a recent paper by Muchnik and Figueroa (1995), there are few investigations of an expanded NAFTA and its effect on Chilean agriculture. This section briefly summarizes their work. The current agricultural tariff structure in Chile is a rather simple one. Since 1991, the tariff on all goods has been 11%, with the exception of selected grains, wheat flour, sugar, and edible oils. These products are protected by a price band scheme which provides both floor and ceiling prices, maintained by variable import tariffs (subsidies). This policy is designed to shield domestic producers from fluctuating world prices. The tariff equivalents of this policy have ranged from approximately fourteen to 35%, depending on the specific crop and relevant world prices. In the United States, tariffs on fresh or low-processed foods are low and increase as the level of value-added (processing) increases. Thus the highest tariffs faced by Chile are in canned and dehydrated fruits and vegetables, including fruit juices. However, there are two important non-agroindustrial products which face high tariffs in the United States. These are asparagus, which faces a 25% tariff between November 16 and September 14, and tobacco which faces an average tariff equivalent of 12%.

Muchnik and Figueroa examine the short-run effects, on both trade creation and trade diversion, of complete elimination of all tariffs in both countries. Overall, they find that imports from the United States to Chile would increase 180%, with over half of the increase explained by

trade diversion, or U.S. exports substituting for (diverting) exports of other countries. Most of this increase comes from cereals, edible oils, and dairy products. Although this increase seems large, it only represents 0.35% of total U.S. agricultural exports in 1993. Chilean exports to the U.S. are expected to increase no more than 9%, or 2.5% of Chilean agricultural exports in 1991. Most of this increase would be in processed fruits and vegetables, with the exception of fresh market asparagus and tobacco, and would come more from trade diversion than trade creation. The methodology used to arrive at these conclusions is short-run in nature, and relies on existing trade flows as a base. Thus, it is necessarily silent on the opening of new markets that do not exist because of existing tariffs, and on longer-run effects that depend on the potential of the Chilean agricultural sector to expand production into new areas, and to further increase the efficiency of existing production. The next two sections of this paper will be used to discuss this potential through an examination of Chilean agricultural capacity and infrastructure.

Agricultural Capacity

A complete examination of agricultural capacity in Chile must address the following two questions. Is the Chilean economy operating at full agricultural capacity? If not, what are the key constraints? The following section is comprised of four subsections outlining the four major determinants of Chilean agricultural capacity: land, capital, labor, and technology.

Land

Chile is comprised of 12 regions, numbering from I in the north to XII in the south. However, from an agricultural standpoint, the primary regions of importance are III-X because I and II are desert, and XI and XII are rainy, cold, and barren. The remaining eight regions are characterized by three major geological formations: the Andes mountain range which consists of high peaks and runs the entire eastern border of the country, the Coastal mountain range which is considerably smaller in height than the Andes and runs along the coast of Chile, and the valleys that lie between these mountain ranges. Thus, only a small portion of the total land in Chile is suitable for agricultural use. Nearly9 million hectares of arable land lies between regions III and X, of which roughly 2 million hectares (22%) is in cultivation. Tomic (1995) argues that the potential for expanding the area under cultivation is limited.

Land owners in Chile are divided between two categories: "campesinos", owners of less than 12 hectares, and "empresarios", larger growers with more than 12 hectares. Campesinos own about 40% of the land used in agriculture and forestry production (INDAP:Camino:1993). As will be discussed in a subsequent section, there may be reason to suspect that the smaller campesino producers are less productive. Thus, although little additional land may be available for expanding agricultural production, the structure of agricultural land possession suggests that further modernization could significantly improve the productivity of currently cultivated land.

Capital

In Chile, the Government does not provide direct agricultural subsidies or subsidized credit, with the sole exception of the INDAP program. INDAP, the Institute for Agricultural Development, provides subsidized credit to small farmers, ranging in subsidy from three to 20% depending on the type and term of investment. However, in 1993, less than one-third of the 260,000 campesinos received subsidies, with an average credit line of about $500. In general, these loans are directed towards crops produced for the internal market such as cereals, potatoes, peas, and onions (INDAP:Memoria:1993).

For those that do not receive an INDAP loan, the only formal alternative is a bank loan that the creditor must be able to guarantee. This is simply not possible for campesinos, nor is it always possible for empresarios. Nevertheless, some farmers do receive credit through the informal sector. This sector generally includes a contract between an agroindustrial company and a farmer, in which the company guarantees a loan in exchange for a guaranteed period of production (Altieri et al.:1994). These contracts fill an important gap, but can severely limit production decisions. Additionally, after both the formal and informal credit sectors are exhausted, there still remains a large amount of farmers (at least one third of the campesinos) without any form of credit.

Even for those who can guarantee their own loans, there exists increasing credit problems. The cost of living relative to agricultural income is rising, which manifests itself in both a higher cost of living for the farmer as well as a labor pool demanding higher wages. Additionally, with the rise of economic prosperity in the urban areas of Chile, the wealthy have begun to purchase land in the country, thus driving up land prices. Lastly, there have been problems with the structure of credit. Loans are extended in denominations of "unidad fomento"

(U.F.) which signifies a peso amount plus inflation. With the rise of inflation faster than farm income, the debt associated with both old and new loans keeps increasing. For those who produce goods for exportation the problem is magnified when the value of the U.S. dollar decreases, thereby further decreasing farm income (Tomic:1995).

Labor

The supply and demand for agricultural labor varies significantly across agricultural commodities. The production of annuals in Chile is a capital-intensive endeavor with a limited amount of laborers contracted on a full-time basis. Labor in this sector tends to be well organized with long-term contracts typically characterizing labor agreements. Due to the nature of these long-term contracts, severe labor shortages are rare. However the demand for labor in fruiticulture and horticulture fluctuates significantly over the course of a season. Demand is highest during harvest, significant during planting, and almost nonexistent between these periods. This has given rise to a labor market involving almost entirely temporary, non-contracted, migrant labor. This labor sector is not unionized and in general there is little communication between labor groups. However, due to the high demand during harvest which tends to be very time sensitive, workers have been known to exercise some leverage.

Historically, this leverage has been exercised against small farmers in the form of threatening to terminate the harvest if higher wages are not rendered. Given the fact that harvest is contracted for a specific week, producers often have little choice but to yield to demands. Nevertheless it is very rare for a producer to lose a harvest due to insufficient labor, although it is believed that these "stand-offs" may sometimes result in reduced yields and quality (Tomic: 1995). To further complicate harvest, many problems exist with the timing of credit. As discussed earlier, for those campesinos not privileged with agroindustrial assistance, the only

form of support is from INDAP. These loans are small, but more importantly they are not necessarily timed in conjunction with demand for credit, which in this case is during harvest. Without this much needed capital, small farmers are left to harvest what they can with their own resources, sometimes leaving a significant portion of their crops in the fields.

Technology

In Chile, there is no general source of technical information that serves the agricultural community, e.g., there is no equivalent to the United States Agricultural Extension. For the most part, the only sources of technical information are the Universities and the Institute for Agricultural Investigations (INIA), and this research is based on modern inputs and technologies which are primarily of use by empresarios. The NGO's have attempted to fill the gap, but it has been estimated that they only reach about 4% of the small farmers (Altieri et al.:1994).

Nevertheless, a new source of technical support is in development. As a response to a huge difference in yields between suppliers, agroindustrial firms are beginning to provide technical information. For example, tomato yields for empresarios are approximately 70 metric tons per hectare, while campesino yields fluctuate between 55 and 70 metric tons per hectare (Tomic: Agroindustria: 1991). Evidence suggests similar production differences in other commodities, and for the most part can be attributed to a lack of knowledge and managerial expertise (Tomic:1995).

These yield variances are not insignificant in terms of agricultural production, especially for exportation, because roughly 50% of the horticultural products supplied to agroindustry are supplied by campesinos. Given that on average campesinos produce yields 10% lower than empresarios, this implies that providing campesinos with better information could increase agroindustrial production of tomatoes by as much as 5%. Extrapolating this to other

agroindustrial products yields a tremendous impact on total agricultural production. However, agroindustrial support has been slow to evolve and is generally only provided to the most important growers working on a contractual basis with agroindustry. Yet a large portion of campesinos that do not produce products for agroindustry, or that do but are of marginal importance, receive no financial help. Thus extension of technical support to this group could have an important impact on production for both domestic and foreign markets at relatively low cost.

Infrastructure

This section will provide an overview of infrastructure in Chile as it applies to agricultural exportation. It is divided into two subsections: transportation and its associated costs, and agroindustry and industrial forestry.

Transportation

Chile's location in the southern hemisphere is a mixed blessing. It has fostered the entry of Chilean agricultural products into the world market via counter-seasonal production, but it is also a source of tremendous expenditure in the form of transportation costs. This cost varies with the value and nature of products, and tends to be truly exorbitant only in the case of fresh fruits and vegetables.

In general, agricultural products from Chile are transported by boat to the United States. One exception is very high-value crops which spoil quickly, such as berries and flowers, which are shipped by plane. Within the category of boat transportation there are two different types: very large slow boats, and smaller, faster boats. The large boats are used for the transportation of agroindustrial products for which time is not a constraint, and this form of transportation is not generally an overly significant expense. In the case of fresh fruits and vegetables, small boats

must be employed in order to deliver the products within 7 to 10 days. This form of transportation is very expensive, and in the case of grapes represents over 30% of the final consumer price in U.S. markets. The remaining percentage is divided as follows: approximately 15% in the hands of the U.S. receiver, 25% to the exporter for commissions, materials, services, etc., and the remaining 30% to the agricultural producer (Calvo: 1995).

Agroindustry and Industrial Forestry

A quick inventory of Chilean agroindustries reveals 14 pulp and concentrated paste plants, 12 canning plants, 13 fruit dehydrating plants, 18 vegetable dehydrating plants, 11 juice concentrate plants, and 22 plants for freezing fruits and vegetables (ProChile: 1993). The pulp and concentrated paste industry is dedicated almost entirely to the processing of tomatoes, of which about half is exported. The canning industry is split between the processing of vegetables and fruits. Approximately 90% of the processed vegetables are tomatoes while the fruits are mostly comprised of peaches, cherries, and jams. Dehydrated vegetable production in Chile more than quadrupled between 1987 and 1989, with bell peppers as the most important component of this growth. The juice concentrate plants are predominately for apples and grapes. In the period from 1987 to 1992, frozen fruit and vegetable production has grown more than fivefold. The key fruits are raspberries and blackberries, while the key vegetable is asparagus.

Each of the plants discussed above operates well below capacity (CORFO: 1995). This may be partly justified by a lack of demand, which would most likely change as a result of a free trade agreement with the United States. However, this may also be partly attributed to the poor yields of campesinos on the raw materials side of industry production. As mentioned before, campesinos contribute as much as 50% of products supplied to agroindustry, thus efficient production of this sector will be key to the expansion of Chilean agroindustry.

Additionally, Chile has a significant amount of infrastructure in industrial forestry, much of which is not being used at full capacity. These industries include sawmills, wood chips, pulp and paper, particle and laminated board, and boxes and crates. There continues to be an inflow of investment in this sector suggesting a further increase in capacity. The future use of this capacity will depend heavily on recent and current forestry plantations.

Further Considerations

Three issues that deserve mention, but that were not included in the Muchnik and Figueroa analysis include: *i.)* expanded U.S. exports of off-season fresh fruits and vegetables, *ii.)* alternatives for Chilean land devoted to cereal crops that will likely experience severe competition under freer trade with the United States, and *iii.)* the importance for Chile of inclusion in NAFTA in the context of other multilateral trade agreements (e.g., MERCOSUR).

Chilean Imports of Fresh Fruits and Vegetables

Muchnik and Figueroa discussed the likely increase in imports of cereals, oils, and dairy products, however there was no discussion of U.S. off-season marketing of fresh fruits and vegetables. This would seem a natural component of further integration between the two countries, because a unique aspect of inter-hemispheric trade is the opportunity for complementing off-season production. In addition to improved variety and quality of off-season produce, environmental benefits from reduced reliance on greenhouse production and storage of fresh produce - both require relatively intensive chemical use - will likely result.

At present, only about 10% of the Chilean population, or 1.4 million consumers, would be in the market for off-season fresh fruits and vegetables. However, Tomic argues that this demand can be met with domestic greenhouse production. In any case, the potential for this market cannot be tested until Chilean phytosanitary laws are relaxed. The Chilean government

views its country as effectively an island bounded by the Andes to the east, the Pacific to the West, the Antarctic to the south, and the world's driest desert to the north. There are few problematic, naturally occurring pests in Chile and phytosanitary laws have been constructed to keep it that way. These laws have severely limited the importation of fresh fruits and vegetables into Chile and this appears to be a tough issue of compromise for the Chilean government.

Changes In Cropping Patterns

As discussed earlier in this paper, Chile is expected to greatly increase its imports of cereals from the U.S. This change in the composition of Chile's import bill has profound implications for land use in Chile. Approximately 48% of agricultural land use in Chile is dedicated to the production of cereals, and the key question is, "What will become of this land?" The bulk of cereal production is in the south of Chile on small farms with relatively poor quality land. Although somewhat dated, existing evidence suggests that the majority of this land is not capable of sustaining either horticulture or fruiticulture production, and due to local geological factors, is not generally irrigated. The most viable alternative to current land use in this area is apparently forestry (Gaete et al.:1975; SAG-ODEPA:1968).

Chile has a comparative advantage in the production of both eucalyptus and pine trees, with a planting to harvest time as much as ten years faster than the United States (Thelen:1995). In addition, as discussed earlier, industrial forestry is operating at a level significantly below current capacity, and in any case new forestry plantations would afford plenty of time for the construction of additional processing plants. The only apparent constraint in this transition has to do with the nature of land ownership and credit. CONAF (1995) has estimated the cost to plant a hectare of forest to be on average $365 per hectare for plantations larger than 5 hectares and $630 per hectare for plantations smaller than 5 hectares. Furthermore, start-up in forestry

typically requires an extended period of time without income. Thus, given that the majority of the land currently producing cereals is land owned by campesinos, lack of credit may be a significant constraint in the transition from cereals to forestry. This difficulty may explain the special provisions in Chile's recent agreement with MERCOSUR that protects Chilean wheat, flour, and sugar producers with tariffs that range from zero to 31% depending on world prices.

NAFTA in the Context of Other Multilateral Agreements

Chile's recent agreement with MERCOSUR highlights an important strategic issue for Chile: how should it coordinate is efforts at integration with all of its various trading partners? MERCOSUR common tariffs are not yet low enough for Chile to fully sign on, but Chile has found it necessary to further strengthen its ties with nearby trading partners while waiting for the United States to move on inclusion in NAFTA. If Chile can also sign on with NAFTA before other MERCOSUR members, it may achieve a "first-mover" advantage in gaining access to new markets. That is, it is easier to maintain access to a market than to come in from the outside, as other MEROCSUR members will have to do.

Conclusions

An increase in Chilean exports of agroindustrial products seems to be an indisputable result of Chilean accession to NAFTA. The extent of this expansion will depend critically on the further development of credit markets, as well as greater provision of technical support to campesinos. At present, agroindustries in Chile are operating well under capacity and should not be a hindrance. Additionally, an increase in the exportation of highly tariffed fresh products such as asparagus and tobacco is expected. Chile will greatly increase its imports of cereals from the U.S., and may begin to import small quantities of fresh produce during the Chilean winter. In response to greater cereal imports, land formerly devoted to cereal production may find forestry to be a more profitable alternative. The success of this transition rests almost entirely on the establishment of an adequate credit market. Like agroindustry, industrial forestry is operating below capacity and should in no way hinder this transition.

Impacts of a free trade agreement for U.S. agricultural exporters will probably be rather small due primarily to the small size of the Chilean market. This agricultural imbalance of trade in favor of Chile is nothing new, and despite increased bilateral trading in recent years, has persistently characterized agricultural trade between these two nations. Nevertheless, this imbalance should not dissuade U.S. negotiators because many of these trade effects are already taking place due to liberalized economies in both countries. In fact, a free trade agreement will primarily serve as a formalization and strengthening of current trade policies, and more importantly will provide a precedent for future economic integration of the western hemisphere.

In short, the impacts on agriculture of a free trade agreement between the United States and Chile are potentially very promising for Chilean exporters. The realization of this potential depends largely on the establishment of Chilean institutional programs to aid campesinos in the

transition from cereal production to a sustainable, alternative source of income, and should include the provision of credit and technical support. Without this support, rural unemployment will inevitably increase and a significant portion of arable land will be fallowed or put to unproductive uses.

References

Altieri, M., C. Benito, P. Faeth, A. Gómez-Lobo, T. Tomic, y J. Valenzuela. Agricultura Sustenable: Un Caso de Simulación para Chile. Universidad de Talca, Chile. 1994.

Calvo, P. "La Explotación de los Productores de Fruta" en La Tercera. #16.527. pg 9. Santiago, Chile.
Sept. 6, 1995.

CONAF. Chile Forestal. #224. Corporación Nacional Forestal. Santiago, Chile. Enero-Febrero, 1995.

CORFO. La Agroindustria Hortofruticola en Chile. Corporación de Fomento de la Producción. Santiago, Chile. 1995.

CORMA. Revista Informativa de la Corporación Chilena de la Madera. #240. Corporación Chilena de
la Madera. Santiago, Chile. Septiembre/Octubre, 1994.

Fuentealba, S. Seminario Sobre: La Articulación de la Agricultura Tradicional con las Cadenas Agroexportadores. "Las Cadenas Agroindustriales de los Berries." División Agrícola Conjunta la Comisión Económica para América Latina y el Caribe (CEPAL) y la Food Agriculture Organization (FAO). Santiago, Chile. Revised 1991.

Gaete, H. y F. Raga. Tesis Meritoria: Análisis de Diferentes Alternativas de Uso de Suelo Agrícola en
Chile. Centro de Planeamiento. Universidad de Chile. Santiago, Chile. 1975.

INDAP. Camino al 2000: Lineamiento Estrategico. Instituto de Desarrollo Agropecuario: Ministerio
de Agricultura. Santiago, Chile. 1993.

INDAP. Memoria: 1990-1993. Instituto de Desarrollo Agropecuario: Ministerio de Agricultura. Santiago, Chile. 1993.

Instituto Forestal y Corporación de Fomento de la Producción. El Sector Forestalen Chile: Logros y
Desafíos. Santiago, Chile. Diciembre 1992.

Instituto Forestal. Boletin Estadistico: La Industria del Aserrio 1993. #36. Santiago, Chile. Noviembre
1994.

Instituto Forestal. Boletin Estadistico: Estadisticas Forestales 1994. #40. Santiago, Chile. 1995.

Muchnik, E. and E. Figueroa. "Chilean Agriculture and Agroindustry in the Face of a Free Trade Agreement with the U.S.A." in Effects of Liberalized Trade on Agriculture in the Western Hemisphere. Agricultural Trade Policy Center. University of Maryland at College Park. 1995.

ODEPA. Estadisticas Silvoagropecuarios: 1987-1992. Oficina de Estudios y Politicas Agrarias. Santiago, Chile. 1993.

ODEPA. Documento Interno. Oficina de Estudios y Politicas Agrarias. Santiago, Chile. Octubre, 1995.

ProChile y Fepach. Catálogo Agroindustrial de Chile. Ministerio de Relaciones Exteriores - Dirección de Promoción y Exportaciones - ProChile y Federación de Procesadores de Alimentos y Agroindustriales de Chile. Santiago, Chile. 1993.

SAG-ODEPA. "Potencialidad de los Suelos de Chile. Unidades de Uso Agrícola de los Suelos en Chile, entre las Provincias de Aconcagua y Chiloé" en Plan de Desarrollo Agropecuario: 1965-1980. Santiago, Chile. 1968.

Thelen, K.D. Personal Communication. Regional Forestry Officer for the United Nations Food and Agriculture Organization. Santiago, Chile. 1995.

Tomic, T. Seminario Sobre: La Articulación de la Agricultura Tradicional con las Cadenas Agroexportadores. "Hortalizas Deshidratos para la Exportacion en Chile." División Agrícola Conjunta la CEPAL y la FAO. Santiago, Chile. Revised 1991.

Tomic, T. Seminario Sobre: La Articulación de la Agricultura Tradicional con las Cadenas Agroexportadores. "La Agroindustria de la Pasta de Tomate para Exportacion en Chile." División de Agrícola Conjunta la CEPAL y la FAO. Santiago, Chile. Revised 1991.

Tomic, T. Personal Communication. Consultor Medio Ambiente y Desarrollo Sustenable en la FAO. Santiago, Chile. 1995.