

CROP PRODUCTION CAPACITY IN NORTH AMERICA

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1. Introduction

Although domestic agricultural and trade policies have influenced and are expected to continue influencing North American crop production projections for the next twenty years, the agricultural sector increasingly reacts to market signals, such as prices and global economic growth. The market situation facing the North American agricultural sector entering the new century is aptly viewed as weak in terms of prices and income. Despite the weak market signals, crop production in USA and Canada has increased, though the production mix has shifted somewhat. This apparent economic contradiction highlights an important aspect of North American crop production, which is that technological advances and economies of size have lowered production costs for large farming operations and enable these producers to remain competitive and grow. Except for emerging water and energy concerns, the cereal crop sector is not expected to face substantial resource constraints through 2020.

Strong foreign competition in a weakened global trade setting reduced the value of

North American agricultural exports and market cash receipts. Much of the projected near-term gains in exports will result from efforts to respond to strengthening market signals. Despite reduced export expectations due to lingering effects of the global crisis in the world economy, the general recovery in crisis countries over the next twenty years will strengthen global demand for North American agricultural exports. Nonetheless, the buildup of global supplies will keep agricultural prices under pressure for several years. This pressure could be reflected in adjustments to farm policies that are designed to aid farm sector income. In USA, for example, many program crop farmers adjusted to lower prices with the help of marketing loan benefits that have provided some safety net assistance to producers by augmenting market returns. In the longer run, global economic growth will support increases in trade and U.S. agricultural exports, although export competition may increase. Presently almost half of the U.S. wheat and 40% of the soybean crops are exported.

2. Past Trends in Demand

2.1 Macroeconomic Influences

Changes in North American crop production are influenced by domestic population, income and urbanization, but not to the extent of other global regions. The main reason for the lack of influence is that both Canada and USA are developed nations in which land is relatively abundant and agricultural production only represents a small portion of total employment. Canada's agricultural sector, for example, contributes 3% to gross domestic product and employs nearly 2 million people, yet occupies about 7% of Canada's 2278 million acres (the Prairie Provinces of Alberta, Saskatchewan, and Manitoba account for 80% of total farmland). With that noted, it is also important to recognize that the financial prospects for North American crop producers are linked closely to growth in international markets, and general macroeconomic conditions.

Commodity exports are sensitive to macroeconomic conditions around the world. Modest improvement in the world economy over the course of the next 20 years, particularly in Asia, will improve North American export prospects. Economic growth is also important for intra-North American trade. Because Canada exports a large share of its agricultural commodities to USA, any possible slowdown in the U.S. economy would slow Canadian export growth.

Canada's economy is expected to grow significantly in the next decade. Canada's trade performance is heavily affected by the value of the Canadian dollar, which may not shift far from its current level in the coming decade. Inflation is expected to be low. The external trade balance and government fiscal health are expected to continue to improve.

3. Past Trends in Crop Production

3.1 Agricultural Policy Issues

Canadian domestic support programs for agriculture include the Net Income Stabilization Account (NISA), crop insurance, and other programs. Wheat and barley in western Canada continue to receive marketing support from the Canadian Wheat Board (CWB), with pricing options that include price pooling for both commodities and a

fixed-price contract for wheat.

NISA, which is Canada's primary income safety net program, is designed to protect farmers from fluctuations in farm income and provide long-term farm income stability. NISA is essentially a risk management tool. Individual producers and Federal and Provincial governments deposit money annually into individual and government accounts. Though NISA remains Canada's primary income safety net program, the role of ad hoc disaster programs is increasing.

Canadian crop insurance protects producers against crop losses caused by weather events or other natural hazards. As with NISA, crop insurance is a three-way cost-shared program among producers, Provinces, and the Federal government. Coverage varies according to crops grown in individual Provinces.

Though transportation subsidies have been eliminated or phased out, the Federal government continues to regulate freight rates. Transportation reform continues to affect Canadian agriculture and trade. When freight subsidies were eliminated in 1995, the cost for shipping Prairie Province (Alberta, Saskatchewan, and Manitoba) crops to export terminals increased. These higher costs reduced farmers' incentives to plant grains and oilseeds. However, Prairie processing and livestock sectors have benefited from reductions in local prices as a result of the end to the transportation subsidy. As a result, value-added processing and livestock operations have expanded in the Prairie Provinces.

Grain production has been the predominant focus of U.S. agricultural policies since the 1930s. Policy has at different times focused on distribution of the nation's vast land resources, on increasing the productivity and standard of living of American farmers, and on assisting farmers in marketing their products. From the 1930s until the 1996 Farm Act, U.S. farm policy focused on price and income supports that relied in part on supply management in the form of acreage limits and storage programs.

Since the early 1980s agricultural policy has broadened considerably to include agricultural trade issues, food safety, food assistance, and conservation and environmental concerns, in addition to the more traditional commodity-focused policies. Beginning in 1985, agricultural commodity policy underwent significant changes that have moved toward greater market orientation and reduced government involvement. Farmer's planting and business decisions were to be guided more by market developments than by the terms and expectations of commodity policies.

Policy in recent years has also addressed environmental and conservation issues and food safety. Concern with liberalizing world trade and competing in world markets has reinforced efforts to reduce government support and increase the flexibility of farmers to make production and marketing decisions based on supply and demand conditions. Nonetheless, the capitalization of program payments into land values is a growing concern. Given the ease with which technology and management practices cross borders, the implicit value of land has become one of the most important factors in determining a farmer's ability to compete in international markets.

3.2 North American Resource Use Issues

In recent years, soybean farmers have increasingly adopted conservation tillage practices to protect soil and water resources and provide other environmental benefits. More than 45% of U.S. soybean acres are conservation tilled. After 1985, many producers adopted conservation tillage practices to meet conservation compliance requirements that were enacted in farm legislation. Higher yields from improved retention of soil moisture also contributed to the trend toward conservation tillage. Tillage systems can also influence input use. With less intensive soil cultivation, weed control depends more heavily on herbicide applications. Pesticide use (mostly herbicides) on soybeans ranks second only to corn.

In 1997, commercial fertilizer was applied to less than 40% of soybean acreage, a much lower rate than for most row crops (e.g., corn, wheat, or cotton). Unlike other crops, soybeans can fix their own nitrogen and require minimal nitrogen fertilizer. Irrigation was used on 1.7 million hectares of soybeans in 1997, or 6% of total acreage. Most of the irrigated soybean acreage is in Arkansas and Nebraska.

Herbicide-tolerant soybeans were among the first bioengineered crops to achieve commercial importance. Since their general commercial introduction in 1996, herbicide-tolerant soybean varieties gained rapid acceptance among U.S. farmers seeking to reduce pest management costs. In 2000, these varieties accounted for approximately 54% of U.S. soybean planted acreage. Farm acreage surveys indicate that soybeans account for the greatest number of biotech crop acres, followed by corn and cotton.

The popularity of bioengineered soybeans with U.S. farmers has ramifications for resource use, marketing, and international trade. Preliminary research indicates that farmers adopting herbicide-tolerant varieties of soybeans have reduced the number of per-hectare herbicide treatments and moved to herbicides with less toxicity. Bioengineering of oilseed crop traits initially focused on improving production attributes such as higher yields and lower costs. However, enhanced end-use characteristics, such as healthier oil attributes, improved animal nutrition, and more palatable food quality are emerging.

Environmental regulations may affect cropping decisions such as production practices. In USA, farmers who receive production flexibility contract payments and loan program benefits must comply with conservation program requirements. Environmental programs such as the Conservation Reserve Program have encouraged removal of land from cropland use, thereby restricting the amount of land available for wheat production. The Conservation Reserve Program (CRP) pays annual rental payments to farmers to idle their land for ten years. Of the 13.2 million hectares currently enrolled in the CRP, about 3.2 million hectares have a history of being planted to wheat prior to enrollment.

Wheat producers are required to adhere to conservation laws, and USDA's Farm Service Agency (FSA) administers several conservation programs. Producers may receive payments from voluntary enrollment in conservation programs including the Conservation Reserve Program and the Wetlands Reserve Program. Wheat area has dropped from its early 1980s highs, due mostly to declining returns relative to other crops and alternative options under government programs. Authorization of the

Conservation Reserve Program (CRP) in the 1985 Farm Act, followed by planting flexibility provisions in the 1990 Farm Act, provided wheat farmers with other options for use of their acreage. Under the 1990 Act, farmers participating in commodity programs could plant up to 25% of their base wheat acreage to crops other than wheat without losing base acreage. Farmers thus had an incentive to grow crops promising higher returns or to earn rental payments from idling land under the CRP.

Whether U.S. farmers will expand their seeding of biotech crops depends, in part, on how they anticipate acceptance of biotech crops in domestic and foreign markets. For example, Japan and the European Union already require labeling of foods containing biotech ingredients, and other countries are considering similar labeling policies. Considerations of consumer preferences have made an issue of the segregation of biotech and non-biotech crops in the marketing chain. Segregation of non-biotech crops would add to grain handlers' costs, and consumers' willingness to pay premiums necessary to cover these costs is uncertain.

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A wealth of relevant information is available in FAO's interim technical report on *Agriculture: Towards 2015/30*, at <http://www.fao.org/es/esd/at2015/toc-e.htm>.

Additional information about U.S. cereal production and related topics can be found at the USDA-Economic Research Service website at <http://ers.usda.gov>.

Biographical Sketch

Greg Pompelli is Chief of the Agriculture and Trade Outlook Branch in the U.S. Department of Agriculture, Washington, D.C. His branch is responsible for conducting and supporting international and domestic agricultural outlook analysis. This analysis includes near- and long-term assessments of changes in significant demand and production factors, and analysis of policy adjustments. Before coming to Washington, he was an Associate Professor of Agricultural Economics at the University of Tennessee, Knoxville, Tennessee. His research interests include international trade issues, agricultural marketing, and foreign direct investment motivations.