



The Production Challenge

BY MIKE RAHM, Ph.D.

The Mosaic Company

Global demand for the leading grain and oilseed crops is projected to increase from about 2.6 billion tonnes today to 3.1 billion tonnes in 2020 and to more than 4.5 billion tonnes in 2050. In fact, demand growth has accelerated despite the Great Recession and lingering fears about the global economy. Demand has increased at a 2.2 percent per-year clip during the last five years compared to a 1.8 percent per-year pace during the first half of the last decade.

Grain and oilseed demand is fueled by three key drivers: 1) steady population growth, 2) increases in income and the upgrading of diets by a swelling middle class, especially in the populous and rapidly developing countries of Asia, and 3) the expansion of grain-based biofuels production, particularly the exponential growth of corn-based ethanol output in the United States.

All of these demand drivers look positive. Global population is projected to increase from 6.7 billion today to 7.6 billion by the end of the decade and to more than 9.0 billion by 2050. Global population currently increases about 75 million people per year—the equivalent of adding another Ethiopia to the world each year.

Based on IHS Global Insight forecasts, global GDP per capita in 2005 dollars is projected to increase from the Great Recession low of \$7,200 to more than \$9,300 in 2020 and to about \$18,700 by 2050. Statistics show people spend a large percentage of the increase in income on protein-rich and more grain-intensive foods such as meat, eggs and dairy products as they move from low to moderate levels of income.

Grain-based biofuels have both passionate proponents and opponents, but political support for these programs looks solid, particularly if energy prices trend up as predicted this decade and grain and oilseed prices remain at moderate levels due to expected yield increases. For example, corn used for ethanol production in the United States is projected to increase to more than 135 million tonnes, or about 5.4 billion bushels, in order to meet blending mandates by the middle of this decade.

Given this positive demand outlook, **the challenge for farmers around the world is to produce another 500 million tonnes of grains and oilseeds per year by the end of the decade—equal to another U.S. harvest**—and to boost global production by more than 70 percent by the middle of this century. Farmers will need to harvest record area and reap ever-increasing yields in order for grain and oilseed supplies to keep pace with accelerating demand.

Put another way, the horse race between grain and oilseed supply and demand looks like a nearly dead heat. Supply will inch ahead and stocks will grow when harvests exceed trend as was the case in 2008 and 2009. Demand

will inch ahead and stocks will fall when harvests fall below trend growth as is the case this year. Nevertheless, **farmers and crop input suppliers will need to whip the supply horse in order for it to keep pace with the demand horse.** That is exactly what futures prices for most agricultural commodities are signaling today for the next several crop years: Keep whipping the supply horse by planting record area and harvesting record yields year after year.

Yet, as highlighted throughout this supplement, achieving the next generation of yields will require a complete bundle of high-technology inputs—including not only promising new seed varieties but also more sophisticated crop nutrient products and practices. For example, feeding 45,000 corn plants per acre will require innovative products that uniformly deliver sufficient amounts of primary as well as secondary nutrients and micronutrients. This also likely will necessitate more precise placement or even multiple applications. One thing we can say with certainty: Meeting future demand will require finding the most synergistic combination of innovative production technologies with which to drive tomorrow's high-yield systems.

