Agriculture in a Changing World

Global Population, Income, Food Demand
Over the past nine years, since 1996, world population has grown by more than 680 million people (US Census Bureau, 2005).

- The global population is growing by more than 73 million people each year. This is only slightly less than adding a population the size of Germany each year.
- The global population is expected to reach 7 billion by 2013 and 8 billion by 2028 (US Census Bureau, 2005).
- The combined effect of population gains and income gains around the world is projected to increase the demand for food by 55 percent by 2030 (FAO, 2003).

Production of primary food and feed crops - coarse grains, wheat, rice and oilseeds - has increased by 21 percent since 1995, while the total cropland devoted to these crops has increased by only 2 percent (USDA-ERS, 2004).

- Productivity gains (yield gains) of primary food and feed crops have accounted for a vast majority of the increased production of these crops and remain vitally important for global food security and land conservation.
- If there had been no productivity gains since 1995, more than 400 million acres (160 million hectares) of new cropland would have been required to produce the actual 2004 total of 2.34 billion tons of primary crops (USDA-ERS, 2004).
- 400 million acres (160 million hectares) is an area larger than the cropland areas of the United States or China. This area would also be equivalent to approximately one-quarter of the Amazon rainforest.
- Based on the current productivity levels of primary crops today, 1.25 acres is required to provide food for each person in the world.
- In 1998, world food expenditure was 21 percent of global national income. In 2003, just five years later, the ratio was slightly more than 18 percent (United Nations National Accounts and Euromonitor).

Hunger, Poverty and the Importance of Plant Biotechnology
The United Nations has established the eradication of extreme hunger and poverty by 2015 as the first Millennium Development Goal (United Nations, 2005).

- According to the UN, "Today in the developing world an estimated 1.2 billion people survive on less than $1 per day, 800 million are undernourished, and 153 million children under 5 years of age are underweight. In Sub-Saharan Africa, half the population lives in poverty." (United Nations, 2005)
- ISAAA has recently commented on this UN goal: "Reducing poverty by half by 2015 is an imperative moral obligation and is one of the most formidable challenges facing the world today, to which biotech crops can make a vital contribution." (James, 2004)

The Food and Agriculture Organization (FA0) estimates 852 million people in the world were undernourished in 2000-2002 (FAO, 2004).

- The United Nations Hunger Task Force estimates 50 percent of the world's hungry people are from smallholder farming communities, another 20 percent are rural landless, about 20 percent are urban poor, and the remaining 10 percent live in communities dependent on herding, fishing or forest resources.
- Every year, more than 20 million low birth weight babies are born in the developing world.
- Undernourishment and deficiencies in essential vitamins are responsible for the deaths of 5 million children each year.
- One child dies every five seconds as a result of hunger and malnutrition.
- Economically, every child whose physical and mental development is stunted by hunger and malnutrition stands to lose 5 percent to 10 percent in lifetime earnings.
- The number of food emergencies due to human-induced or naturally-induced causes, such as weather, has doubled since the 1980s from an average of 15 per year to more than 30 per year.
- Weather-related food emergencies, primarily attributable to drought, account for nearly one-half of all food emergencies each year (FAO, 2004).

* Present discounted value.