

Plant Breeding: It's a Journey, Not a Destination

Food and fiber for an ever-increasing world population

The world's population continues to increase, doubling from 3 to 6 billion between 1960 and 1999. By 2050, the number of humans is expected to exceed 9 billion. Providing food and fiber for this enormous population is an ominous challenge facing humankind, without significant addition of new arable lands, challenges of changing weather patterns, and decreased quantity and quality of fresh water. Genetic selection by plant breeders brought about the 'Green Revolution' of the 1960s and 1970s that increased production of major crops and saved millions in the developing world from starvation. Plant breeders continue this success story by developing superior crops to meet the world needs for food, fiber, and fuel.

Plant Breeding: Continuous investment pays continuous dividends

Plant breeding is never complete. Long-term support of plant breeding is the major reason why the USA still leads the world in agriculture, fueling economic growth, new businesses, and new jobs. Today's high-quality, superior-yielding crops are the foundations of even better plants for tomorrow. However continuous increases in crop productivity and quality are directly tied to sustained investment in plant-breeding personnel and infrastructure, such as research stations, greenhouses, labor and materials for crossing and selection, etc. Examples for which long-term investment in plant breeding have paid off handsomely include:

- Continuous selection of grains and oilseeds has increased productivity without requiring more land for cultivation (Fig. 1);
- Selection over 90 years has transitioned blueberry from a wild plant to today's #2 berry crop in the US (Fig. 2);
- Breeding of loblolly pine over the last 50 years has produced trees that grow straighter and yield 30 to 50% more wood per acre (Fig. 3);
- Increased nutritional quality of vegetables; today carrot is the primary source of vitamin A in the US diet (Fig. 4);
- Improved pest resistance prevents crop losses and limits pesticide use.

Plant breeders rely on sustained funding for long-term selection of crops to address such challenges as:

- Increased global trade introducing exotic pests or pathogens;
- Higher mean temperatures and humidity making endemic diseases and pests more serious;
- Drought and reduced access to fresh water contributing to significant yield reductions;
- Increasing input costs for fuels and fertilizers.

Recommendations:

Sustained funding of plant breeding by commodity groups, private industries, USDA, and other state or federal agencies to:

- Support the infrastructure and long-term commitment required to develop superior crops for US production and global consumption;
- Train the next generation of plant breeders to address the needs of a growing world population with fewer inputs and decreasing arable land.

For more information:

Please visit the website of the National Association of Plant Breeders (NAPB) at <http://www.plantbreeding.org/napb/sustainingplantbreeding.html>

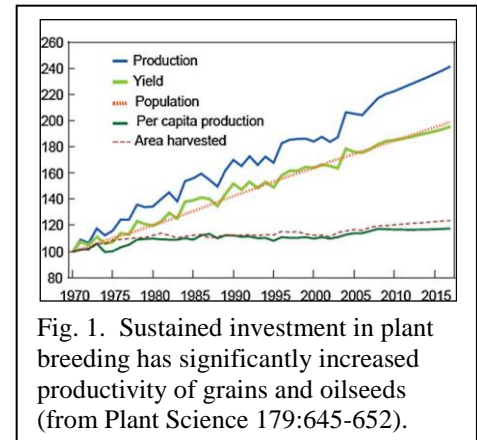


Fig. 1. Sustained investment in plant breeding has significantly increased productivity of grains and oilseeds (from Plant Science 179:645-652).



Fig. 2. Superior blueberry bushes selected from wild progenitors (B. Strik, Oregon State Univ.).



Fig. 3. Controlled crossing of loblolly pine (S. McKeand, North Carolina State Univ.).



Fig. 4. Continual selection of carrot for deeper orange color increases Vitamin A content (<http://www.agripinoy.net/growing-carrot.html>).