NATIONAL PLANT BREEDING INITIATIVE

Plants are the basis of our food and fiber supply, whether based on a completely vegetarian or animal diet. Healthy, productive plants are vital the national security of all nations because food shortages universally lead to medical problems, human suffering and political unrest. Urban and rural communities also benefitted from new varieties of turf grasses and ornamentals that have increased aesthetic values. As the plant is the foundation of food and fiber supplies, ***plant breeding*** is the foundation of plant improvement by leading to high yields, good quality, and safe foods.

Plant breeding is the science of applying genetic principles to create or manipulate economically important traits in plants for human use.

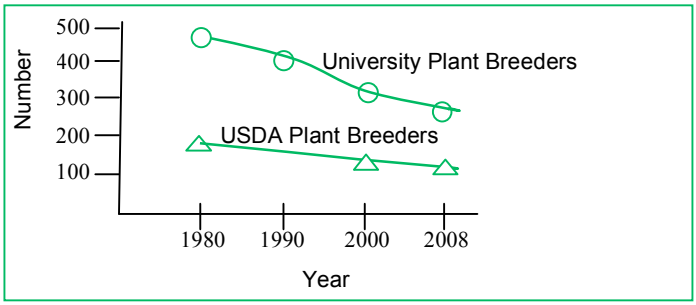
While only a handful of crops supply most of the calories and protein in the human diet, many hundreds of species are cultivated for their food, fiber, and fuel potentials. People have selected diversity for colors, textures, and sizes over the millennia. Prior to the inclusion of genetic principles into plant breeding, yields had hit a plateau. Until the 1920s, corn averaged only 30 bushels per acre whereas today it averages more than 150 bushels per acre, in large part due to plant breeding efforts.

Plant breeders

- Investigate important biological questions
- Create productive, high quality varieties
- Maintain a safe and secure source of food and fiber through plant selection
- Utilize and preserve plant biodiversity
- Strive to maintain harmony between agriculture and the environment
- Keep American agriculture competitive
- Improve rural life by adding economic value to existing crops and developing newly adapted crop types

Plant breeding emerged as a science during the early 1900s when genetic principles were incorporated in plant selection. Variety improvement began at public universities, but as hybrid cultivars were developed with protection of intellectual properties, the private sector of plant breeding emerged. Private companies concentrated their efforts on large-acreage or high value crops. Crops presenting challenges in manipulation, economic returns, or environmental sensitivity are left for the public breeders where research and education is the purview.

Today, the plant breeding community consists of both public and private plant breeders who have a vision of productive, high quality varieties which maintain a safe and secure source of food and fiber for our population. These breeders wish to utilize and preserve plant biodiversity for future generations as to maintain harmony between agriculture and the environment. Plant breeders play a critical role in assuring the agricultural system is highly competitive in the global environment as they increase the quality of life for all Americans. Therefore, continuing long-term programmatic support and educating new plant breeders are critical for the future of agriculture in the U.S.



Plant breeders work with the protein and carbohydrate staples for our diet such as corn, wheat, rice, potato, and barley; oil crops such as soybean and peanut; vegetables and fruits; biofuels such as grasses and canola; specialty and nitch-market crops; ornamentals and turf grasses; forages for the animal industry and environmental preservation; and forest trees. The economic problems associated with each crop are different, but several consistent themes emerge: breeding for disease and pest resistances, improving water use efficiency, increasing yields, and improving quality.

The advent of genomic sciences during the late 1900s reshaped the landscape for plant genetic research and plant breeding. New technologies promised rapid advances in plant improvement, and as a result, a large percentage of plant breeding positions in the public sector were redirected into this promising new field of science. An explosion of new data explained many of the processes by which plants grow and protect themselves against pathogens and pests; but while basic science has greatly advanced, there are few examples of direct benefit to the producer or consumer. The missing component is plant breeders who translate genomic data into solutions for crop production.

Administrators now recognize that plant breeders serve as the bridge between biotechnology and the producer because a package of traits is required for commercial production. However, here no longer exists the capacity to develop new adapted varieties for many crops. Plant breeding programs are long-term investments that require 10 or more years before varieties are ready for production, yet the number of faculty programs at universities has declined so that the capacity to educate enough scientists no longer exists nationally.

To reverse the trend in declining plant breeding research and education, a ***National Plant Breeding Initiative*** is proposed.

NATIONAL PLANT BREEDING INITIATIVE

1) **Establish a competitive grants program for long-term plant breeding research and education. Funding: $50 million/year**

   The goal is to increase knowledge about methodologies and biological processes leading to improved varieties to meet national priorities in food security and safety.

2) **Establish regional plant breeding technology resource centers. Funding: $30 million/year**

   The goal is to develop cost-effective research capabilities to enhance marker assisted breeding and the genetic improvement of crops through transformation technologies.

3) **Increase line-item funding for plant germplasm maintenance, evaluation, and long-term plant breeding research. Funding: $70 million/year**

   The goal is to assure the U.S. national plant genetic resources are preserved as part of our national heritage and to utilize these materials to meet our future needs for food, fiber and energy.

The proposed **$150 million** funding for **Plant Breeding** will lead to:

- Increased numbers of cultivars and genetic resources for crops outside the purview of private industry
- Increased research emphasis for:
  - Investigating genetic variation in crop varieties
  - Increasing disease & pest resistances in varieties
  - Improving quality & safety of food products for consumers
  - Selecting non-biotic plant stress resistances in varieties
- Increased numbers of high quality programs in plant breeding education to assure a future workforce.
- Centers to support application of molecular technologies into plant improvement programs.
- Integration of biotechnology and genomics sciences with plant breeding so that molecular technologies can be utilized in practical applications for human society.
- Assurance that the vast quantities of plant genetic resources available in the U.S. will be preserved and utilized as our national heritage for future generations.