Celebrating 100 Years of Beltsville

For the Henry A. Wallace Beltsville Agricultural Research Center (BARC), the year 2010 marks a significant moment in its history. The arrival of BARC's 100th anniversary is a time to commemorate past research successes, celebrate current research efforts, and anticipate future endeavors.

But this celebration is not just for BARC alone; it's a celebration for all of the Agricultural Research Service. You see, much of the research currently being conducted by ARS labs around the country originated at BARC. For example, Daniel E. Salmon and his assistants were the first to isolate and discover *Salmonella* bacteria in pigs. In 1910, they were asked to continue their *Salmonella* research with USDA at the newly formed BARC. Now, a century later, ARS labs in Albany, California; Ames, Iowa; Athens, Georgia; Clay Center, Nebraska; College Station, Texas; and Wyndmoor, Pennsylvania, have joined BARC in continuing the research started by Salmon to help USDA remain a leader in *Salmonella* research.

Even before BARC's official formation in 1910, its scientists were on the cutting edge of agriculture. Charles V. Riley, the top entomologist for USDA until 1894, was the first to practice biological pest control by introducing the Vedalia beetle from Australia to control scale on citrus.

Of course, Riley's research wasn't conducted on BARC's current campus. It was conducted at USDA's first location on the National Mall in Washington, D.C. USDA also had other experimental farms and research stations located close by in Virginia and Maryland. In 1910, USDA's purchase of the Walnut Grange plantation in Beltsville marked the beginning of BARC. Surrounding land and buildings were later purchased to house more research laboratories, and the experimental farms and research locations were moved to Beltsville.

Large-scale expansion, however, didn't occur until the 1930s, during the Great Depression. Then-Secretary of Agriculture Henry A. Wallace believed that research was the best way to advance agriculture and preserve the environment. Thanks to him, BARC now sits on about 7,000 acres and remains a world leader in agricultural research.

Throughout the past 100 years, there have been numerous agricultural breakthroughs made by BARC scientists. Here in this photo journal, we highlight just some of those accomplishments. If BARC's history is any indicator of its future, we'll see many more discoveries in the next 100 years.—By **Stephanie Yao,** ARS.

More information about the Beltsville Agricultural Research Center can be found at www.ba.ars.usda.gov. ✷

STEPHEN AUSMUS (K11275-2)

BARC is the largest, most diversified agricultural research complex in the world. Research is conducted through programs at the U.S. National Arboretum, the Animal and Natural Resources Institute, the Beltsville Human Nutrition Research Center, and the Plant Sciences Institute.

1920s

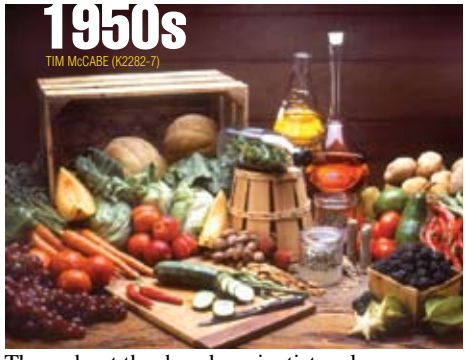
PEGGY GREB (D1448-3)

BARC researchers solve a major food problem: the short shelf life of butter. They show that using pasteurized sweet cream instead of sour ripened cream helps butter last longer. Nowadays, ARS researchers in Beltsville, Maryland; Peoria, Illinois; Wyndmoor, Pennsylvania; Albany, California; and New Orleans, Louisiana, are looking at ways to improve the shelf life of many foods.

1930s

KEITH WELLER (K8753-1)

BARC scientists produce the first successful vaccine to immunize cattle against brucellosis, a serious disease that causes high incidences of abortions, among other effects. Elk (above) are reservoirs of the disease, which is transmissible to other animals and humans. Brucellosis research continues at ARS laboratories in Ames, Iowa.



1950s

TIM McCABE (K2282-7)

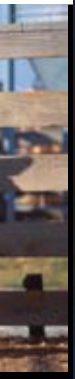
Throughout the decade, scientists release a steady stream of new varieties of fruits and vegetables with enhanced disease resistance, better flavor, and other desirable traits. ARS laboratories all over the country continue this work.

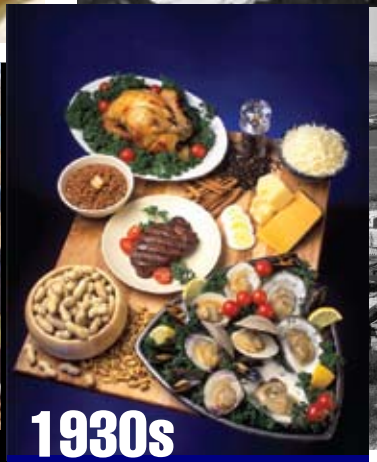
Agricultural Research

SPECIAL COLLECTIONS, NAL (J HORACE McFARLAND COLLECTION D1741-1)

1920s

In 1924, BARC researchers release Mary Wallace, the first shrub rose that is also multi-disease resistant. Named after the daughter of the Secretary of Agriculture, this rose is voted in 1928 the most popular rose in the United States. Today, ARS researchers at the U.S. National Arboretum and in Poplarville, Mississippi; Corvallis, Oregon; and Miami and Fort Pierce, Florida, continue to develop plants with desirable traits.





1930s

KEITH WELLER (K9834-1)

After determining the role of vitamin A in maintaining sight, researchers determine adults should consume a minimum of 5,000 to 6,000 international units of vitamin A per day. Later, in the 1970s, scientists at the Beltsville Human Nutrition Research Center discover that supplementing vitamin A with zinc helps prevent blindness. ARS has five other human nutrition centers in Boston, Massachusetts; Houston, Texas; Grand Forks, North Dakota; Davis, California; and Little Rock, Arkansas.

1930s

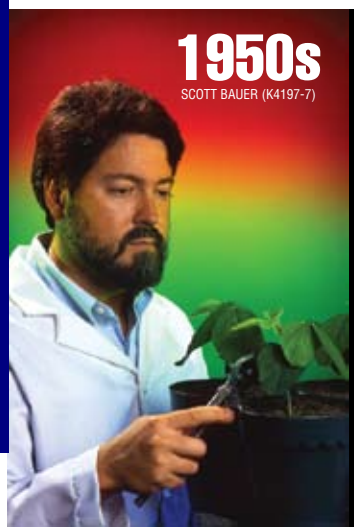
(D1783-1)

Many government agencies began as part of USDA and were located in Beltsville. The list includes the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, the U.S. Geological Survey, and the USDA Forest Service. Other agencies—the National Aeronautics and Space Administration, the U.S. Department of Commerce, and the Office of Naval Research—also conducted research projects on USDA land in Beltsville. Collaborative research between USDA and other agencies continues today.

A new group of pesticides safer for humans—DEET, DDT, rotenone, and allethrin—help keep soldiers safe from insects and the diseases they spread. To this day, ARS continues to work with the U.S. military to solve problems.

1940s

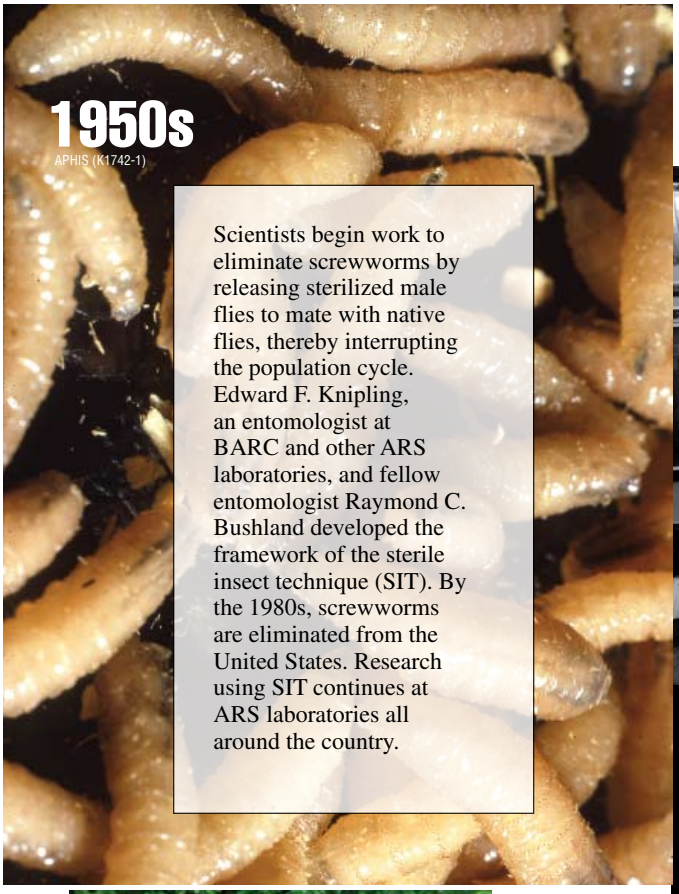
SCOTT BAUER (K7243-7)



1950s

SCOTT BAUER (K4197-7)

Photoperiodism (discovered in 1918) shows that flowering in plants is controlled by changes in day length. In the 1950s, BARC scientists discover phytochrome, a dual-form plant protein that determines when a plant will start, or put off, flowering. This serves as a core concept in plant physiology in labs all around the country today.



1950s

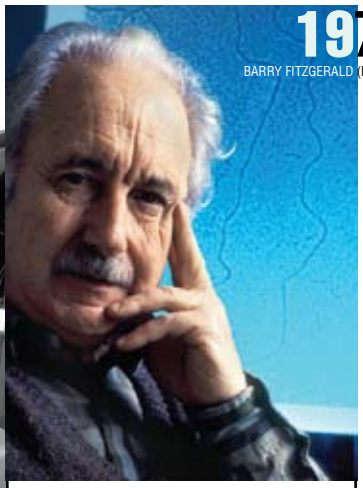
APHIS (K1742-1)

Scientists begin work to eliminate screwworms by releasing sterilized male flies to mate with native flies, thereby interrupting the population cycle. Edward F. Knipling, an entomologist at BARC and other ARS laboratories, and fellow entomologist Raymond C. Bushland developed the framework of the sterile insect technique (SIT). By the 1980s, screwworms are eliminated from the United States. Research using SIT continues at ARS laboratories all around the country.

BARC agricultural engineer Karl Norris develops the first computerized near-infrared spectrophotometer. This noninvasive technique measures numerous traits without destroying the sample. Today it is used to help keep our food supply safe and ensure the quality of many of our commodities.

1960s

FRED WITT (K9635-1)



1970s

BARRY FITZGERALD (K3146-1)

Plant pathologist Theodore O. Diener discovers the viroid, the smallest known agent of plant disease. His discovery is ranked among the top 10 milestones for plant pest and pathogen research by the American Phytopathological Society.

1990s

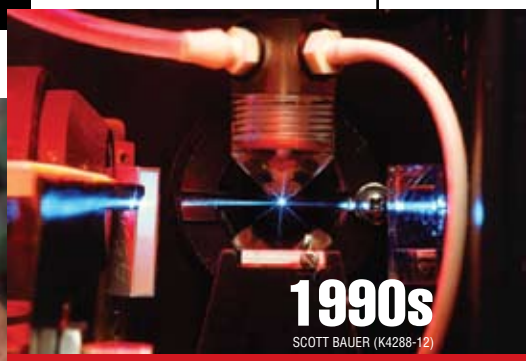
SCOTT BAUER (K7814-2)

In the 1990s and 2000s, breeding and selection at the U.S. National Arboretum leads to the introduction of 10 elm cultivars resistant to Dutch elm disease, which nearly wiped out the entire U.S. elm tree population in the 1940s. Scientists also introduce six red maple cultivars with symmetrical forms, long-lasting fall color, and insect tolerance.

1990s

SCOTT BAUER (K8618-1)

Working with industry counterparts, BARC scientists discover in 1999 a fungus that inhibits a devastating disease on cacao trees. This finding could help save the $8.6 billion U.S. chocolate industry, which depends entirely on imported chocolate.



1990s

SCOTT BAUER (K4288-12)

BARC researchers develop technology to separate X- and Y-bearing sperm in animals, allowing sex selection of offspring and contributing to better breeding practices.

The Germplasm Resources Information Network (GRIN) is established as the world's most comprehensive database of agriculturally important plants. BARC scientists direct USDA plant exploration all over the world. Germplasm that is collected is maintained in ARS collections throughout the country.

1980s

(K1563-2)

Researchers start using remote sensing from satellite images to detect nutrient deficiencies in crops and environmental conditions such as soil erosion. They also develop models to help determine efficient use of land and water, crop yield forecasting, and drought assessment.

1980s

(K1165-2)

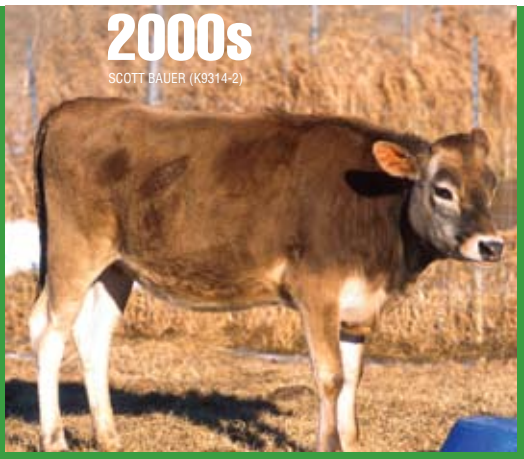
1980s

SCOTT BAUER (K7246-1)

Studies show that decreasing dietary animal fat and increasing the portion of fat from vegetable sources significantly lowers blood pressure in people having high blood pressure.

2000s

SCOTT BAUER (K9314-2)



In 2001, BARC researchers develop the first transgenic cow, named "Annie," with resistance to mastitis. The disease is caused by *Staphylococcus aureus* bacteria that destroy milk-secreting cells in the animal's mammary gland. Mastitis costs U.S. dairy farmers about $1.7 billion annually, including lost milk revenues.

2000s

STEPHEN AUSMUS (D1480-1)

In 2002, as part of an agreement with the nonprofit Horticulture Research Institute, scientists begin research to create a nonpetroleum-based biodegradable plastic plant container made from biowaste products. In 2009, scientists release the first biodegradable flowerpot made from discarded chicken feathers. The nursery industry uses about 1 billion pounds of plastic containers per year, and waste from these containers is generally not recyclable.

2000s

SCOTT BAUER (K5111-7)

Honey bee populations have been declining as a result of parasites and diseases. In 2000, BARC developed a screened-bottom-board insert for bee hives that helps reduce the number of parasitic *Varroa* mites. In 2005, scientists received U.S. Food and Drug Administration approval for an antibiotic to control American foulbrood, one of the most destructive and widespread bee diseases.

SCOTT BAUER (K9076-1)

2000s
SCOTT BAUER (K8295-1)

In efforts to improve the health of the Chesapeake Bay, BARC researchers work with federal and Maryland state government agencies to improve the implementation of winter cover crop programs. They develop remote sensing technology for landscape-scale monitoring of the effectiveness of cover crops to sequester nutrients and keep them from washing into the bay.

Over the past 100 years, scientists with the U.S. National Arboretum have developed and released more than 650 cultivars for the floral and nursery plants industry, an $8 billion industry nationwide. Fifteen of these cultivars are Gold Medal or All-America Selection winners.

2000s
STEPHEN AUSMUS (D887-2)

BARC scientists develop a method for measuring individual trans fats in foods. This method has a broad use in food analysis and subsequent labeling of foods. BARC research in humans shows that trans fats raise serum cholesterol, leading to the recent U.S. Food and Drug Administration requirement for food labels to show trans fatty acid content.

2000s
KEITH WELLER (K8148-9)

2009
PEGGY GREB (D1526-1)

BARC scientists use the sequence of the cow genome to predict milk production in dairy cows with three times higher accuracy and at one-twentieth of the cost. They are also now able to provide the information at birth rather than at 5 years of age. This technology has revolutionized the dairy industry in just 1 year.

2010
PEGGY GREB (D674-3)

Issues affecting agriculture, such as climate change and decreases in available resources, pose significant challenges in the coming years. As we aim to find solutions to these problems, BARC will continue to be a leader in agricultural research every step of the way.