

Did You Know?

Americans enjoyed the first Hershey's milk chocolate bar in the 1900s, and M&Ms have been world-famous since 1941. But chocolate itself has been around for much longer, dating back to at least 1000 B.C. Cacao trees, which produce the beans that chocolate is made from, are believed to have originated more than 4,000 years ago in the Amazon. Today, consumers can enjoy an array of chocolate offerings—milk, dark and white chocolate, and many other added flavorings—including an endless assortment of other chocolate confections.

ARS scientists at the **Sustainable Perennial Crops Laboratory** and the **Systematic Mycology and Microbiology Laboratory** in Beltsville, MD, along with collaborators, are working to ensure our cocoa supply for the cacao-based consumer products we enjoy will be around for centuries to come. Worldwide demand for cacao exceeds production, and hundreds of thousands of small farmers and landholders throughout the tropics depend on cacao for their livelihoods. Cocoa and cocoa butter are also made from cacao. An estimated 70 percent of the world's cocoa is produced in West Africa.

Cacao trees (*Theobroma cacao*—Greek for “food of the gods”) are grown in tropical regions of the world like Peru. Cacao trees face major natural disease threats from fungal diseases such as black pod rot, frosty pod rot, and witches' broom that can wipe out up to 80 percent of the crop, and cause an estimated \$700 million in losses each year. ARS researchers are working to identify new cacao tree types that may be resistant to these diseases. Also, in their recent expedition to Peru, they found several promising natural fungi that could one day be used as a biological control against these devastating diseases.

The scientists and their collaborators have made other recent strides that may help protect this crop, and could result in new consumer products in the future. In 2010, ARS scientists and partners announced the preliminary release of the sequenced cacao tree genome, an achievement that will help sustain the supply of high-quality cocoa to the \$17 billion U.S. chocolate industry. The knowledge gained from this discovery will help breeders more precisely develop new varieties—using traditional and

high-tech methods—that are able to withstand droughts, diseases, and crop pests.

The team's most recent Peruvian discovery may reap huge rewards for chocolate lovers worldwide—cacao trees whose beans may one day result in unique, new complex flavorings. They will continue to look at these wild cacao varieties and gather flavor information on these trees.



Ideally, the result will be chocolates from different regions of the world with distinctively different flavors.

Enjoy the holidays with a cup of hot cocoa, and don't forget to thank an ARS scientist!

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