

## Will genome sequencing benefit everyday dahlia growers?

Many of the benefits of research will trickle down to the everyday grower. For example, in corn the benefits have been at least 90% to growers. Using the research, companies have been able to develop corn that is better able to withstand insects, cold, heat, and wind.

The following are examples of how this project could benefit dahlia growers.

-Scientists could compare dahlia DNA to other flower species. An example of this might be comparing the various pathways that more resilient plants use to fight pests; traits that not all plants possess.

-Scientists could determine the pathways that currently exist in dahlias, aiding efforts to breed dahlias more resistant to specific pests. In particular, several “plant-specific” pathways exist that can silence viruses or prevent viruses from moving from leaf to leaf in an infected plant. Knowledge of which pathways exist would aid in strategies to breed virus-resistant lines.

- The Dahlia Genome Project will provide a tool kit for understanding which genes are expressed in any given cultivar. Through domestication and breeding, some varieties have lost specific pathway genes. Knowing what’s missing provides an approach to restoring genes in a particular variety by conducting crosses with a line that contains a functional copy of the missing information.



Species dahlia blooms grown from seed collected in Mexico through the ADS Genome Project.

Donations can be made to the American Dahlia Society. Any and all donations are welcome. Please indicate on the memo section of your check that you would like the funds to be used for the Genome Project. Mail your check to:

**ADS Genome Project  
American Dahlia Society  
38430 Piggott Bottom Rd.  
Hamilton, VA 20158**

Please make checks out to:  
The American Dahlia Society.

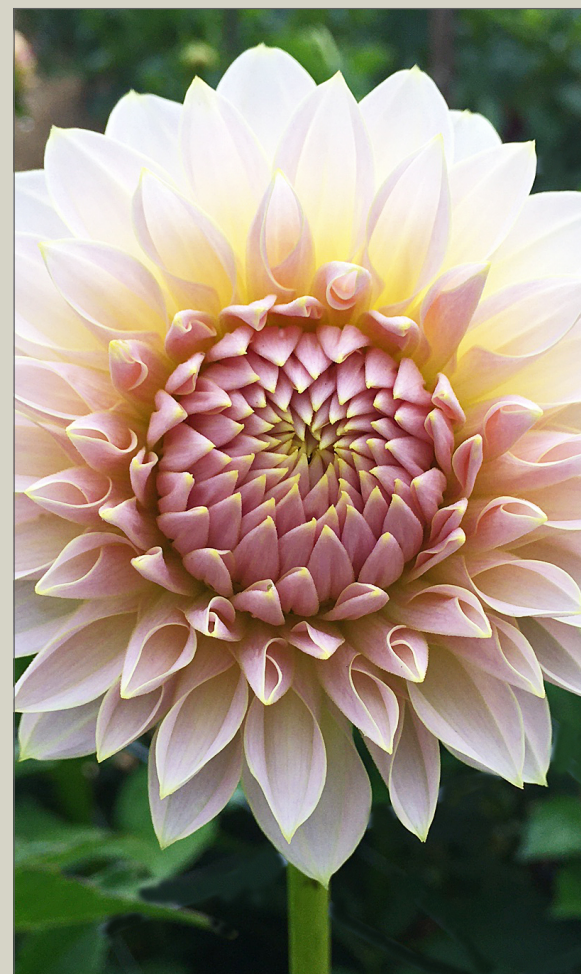
...or you can scan the QR code below and make your gift through PayPal.

The American Dahlia Society is a 501(c)(3) non-profit organization and donations are tax deductible. Tax ID #: 23-2123580



## AMERICAN DAHLIA SOCIETY

### Dahlia Genome Project Phase Two



**We need your help.** The American Dahlia Society (ADS) is asking for your help to move the Dahlia Genome Project forward to its next phase. Please give today.

**What was achieved in Phase One?** In 2016 ADS raised funds in Phase One to start sequencing the dahlia genome. Species dahlia seeds were collected in their native habitat and grown by ADS volunteers and at Stanford University. Leaves from 15 species dahlias and 11 modern dahlia varieties were analyzed with RNA sequencing. **The surprising result:** modern and species dahlias are genetically indistinguishable. This suggests that, rather than multiple genetic lines, modern and species dahlias spring from one common gene pool, similar to what we know about dogs: one common gene pool with wide variation in characteristics.

Special thanks to Dr. Virginia Walbot of Stanford University who inspired ADS to start the genome project and worked pro-bono to see us through Phase One.

#### **What will be accomplished in Phase**

**Two?** The ADS Genome Project has a new home at the Harkess Laboratory at Auburn University and HudsonAlpha, the largest genome sequencing lab in the nation. ADS volunteers are growing species dahlias in Alabama and Georgia and plant material will undergo genome sequencing to resolve the dahlia family tree and fully sequence a species dahlia. In addition 15 modern dahlia varieties will be sequenced.

# The Dahlia Genome Project: Phase Two

## **How much is needed for Phase Two?**

The goal for Phase Two is \$46,000. ADS would like to thank the **Scheetz-Chuey Foundation** for their dollar-for-dollar matching grant of \$23,000 that gets us half way to our goal. These funds, when fully raised, will support a graduate student for two years who will work exclusively on the dahlia genome.

Please see the back of this brochure to learn how to give a gift.

Thank you to all ADS donors who gave a gift to Phase One. Your support moved the project to its next phase and some of your gifts are still at work. Gifts will be used to fully sequence the dahlia genome as this project moves forward.

**The American Dahlia Society is currently working with Washington State University on viruses in dahlias. Could genome sequencing tie in with that research?** Yes, sequencing the dahlia genome could pinpoint where genetic viral defenses might be found. It could increase the likelihood of breeding plants with enhanced viral resistance.

**If the genome is sequenced, what are some long term and short term projects that scientists might undertake?** Comparing dahlia DNA to other flower species would interest scientists that study flower and plant evolution. Longer term projects could involve building tools for breeders.

**Are there any examples of other cultivars that have had their genomes sequenced? After sequencing, what research resulted for those cultivars?** There are thousands of sequenced flowers and vegetables. Work on corn, for example, has allowed scientists to pinpoint precisely which genes contribute to specific traits: growth habit, drought resistance, photoperiod sensitivity, height, ear properties, yield, etc. A genome road map will ensure future projects are faster and more likely to produce a precise result.

## **More About The Genome Project**

To learn more, please visit the American Dahlia Society website at [www.dahlia.org](http://www.dahlia.org). Click on “research” then click on “genome project.” There you will find a timeline, background on the scientists, the two year scope of Phase Two, and a ten year plan moving forward.