



# Student Collaborative Organic Plant Breeding Education

## SCOPE Zinnia Breeding Project

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The Student Collaborative Organic Plant Breeding (SCOPE) program has developed a program for the genetic improvement of zinnia flowers for organic production here in California. The program has sought to develop zinnia varieties with novel colors, unique color and petal shape combinations, and improved agronomic traits to benefit organic growers. Because of their localized production, zinnias offer a unique way for farmers to diversify their farm and provide additional income through cut flowers, all while building resiliency and supporting pollinator habitat. The program also has trained graduate and undergraduate student in novel breeding techniques and ornamental production systems.

### The SCOPE program has focused on several key traits in zinnias:

- Novel colors
- Darker and lighter pastel color
- Bicolor flowers
- Unique color/petal shapes
- Improved stem length
- Improved flower size
- Improved vase life
- Powdery Mildew Resistance

### To achieve the goals of the program and improve several traits as once, the breeding program has been dividing into four breeding groups:

- Pastel Intermediate
- Improved Queen Lime
- Bicolor Cactus
- Smaller Benary's Giant



These traits were selected based upon feedback from growers in and around the Davis community.



## Progress So Far

The zinnia program is on its third field season. The first season, we evaluated available germplasm and made hundreds of crosses. In the second season, we selected crosses that fit into our defined breeding groups, then grew out those crosses. We evaluated the offspring then crossed and self-pollinated the highest performing plants. In the current season, we evaluated the offspring again and selected the best individuals to cross.

We have observed the following results:

- New and unique colors previously unseen in germplasm selection
- New color and flower shape combinations
- 28% increase in mean stem length of the population
- 30% increase in mean flower size of the population
- We are continuing to explore the genetic vase life of zinnias.