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## Introduction

Table grapes (*Vitis vinifera*) are one of the most popular and widely produced fruits. Marketing efforts from the California Table Grape Commission, and the USDA have encouraged U.S. retailers to handle more varieties of table grapes, as well as to increase international demand of U.S. table grapes.

Over the last three decades U.S. consumption of table grapes has increased from 2.9 pounds per capita in 1970 to 7.5 pounds in 2003. Due to the increased demand for table grapes, the U.S. remains a net importer; importing roughly \$732 million worth of fresh grapes in 2004 (Kreith, 2006). Increasing production of U.S. table grapes could offset the need to import. However, table grapes grown in regions other than California such as the Southeast require intense disease and insect management.

The Young Scholar in this project monitored disease and insect damage of table grapes grown under a high tunnel production system to determine sustainable production techniques, feasibility, and best practices for local farmers. Additionally, the Young Scholar assisted in evaluating the benefit of different trellis systems and fruit thinning treatments on growth and yield of table grapes.

## Purpose and Objectives

The purpose of the Young Scholar Enhancement Program (LS-17-282) was to provide the intern with experiential learning opportunities. The scholar gained practical experience in multiple management areas and facets of table grape production under high tunnel conditions. To accomplish this the young scholar participated in the following research objectives:

- To assess disease and insect incidence with a pesticide management program in place in both high tunnel and open field environments
- To determine the performance of different grape cultivars within the pesticide management program.



Fig 1. Left to right: (a) Healthy Gratitude cultivar cluster; (b) measuring total weight (kg) of fruit harvested from one plant; (c) Black rot (*Guignardia bidwellii*) on Hope cultivar cluster.

## Activities and Methods

Research was conducted at three different locations in Arkansas: University of Arkansas Agriculture and Research Center, Fayetteville; University of Arkansas Fruit Research Station, Clarksville; and Barnhill Farms, Cabot. Multiple locations in Arkansas provided reproducible data needed to compare research results. Four cultivars of table grapes were used for data collection (Jupiter, Faith, Hope and Gratitude). The Young Scholar was trained in all aspects of vineyard management.

- Monitored and collected data of pests in each location to determine appropriate management practices.
- Assisted in collection of data to determine growth and yield of table grapes, to include: pruning and training of vines, irrigation, leaf and fruit thinning, PAR (photosynthetic active radiation) measurements, pesticide application, weeding, harvesting, etc.
- Assisted in weekly maintenance of vines including pruning, combing, and trimming.
- Identified and recorded data of three common diseases of table grapes: black rot (*Guignardia bidwellii*), powdery mildew (*Uncinula necator*), and bunch rot (*Botrytis cinerea*).
- Assisted in collection of data for marketability and physiochemical research of table grapes.

## Knowledge and Skills Learned

The knowledge and skills gained through the S-SARE Young Scholar enhancement internship included experiences in many facets of vineyard management that could not be reproduced in a classroom.

- Pruning and training methods for young grape vines
- Mixing and application ratios for pesticides and fungicides
- Operation of scientific instruments including: PAR meter, refractometer, tensiometer, spectrophotometer, and watchdog weather station
- Collection and interpretation of scientific data
- Operation of heavy farm machinery

## Summary

The S-SARE Young Scholar enhancement internship in sustainable horticulture provided a valuable learning experience through hands on application. The skills acquired by organizing, collecting, and evaluating data allowed the scholar to explore a new career path.

The internship also provided the opportunity to network with professionals in the field of horticulture. The position introduced communication with local farmers, researchers, and fellow students in the industry.

Additionally, the internship provided insight for future research projects about the benefits of growing table grapes under high tunnel production systems.

## Results

Two treatments were used to improve the growth and yield of table grapes. Clusters were not thinned from the control group of plants. Plants in treatment two had clusters thinned at pea size. Clusters thinned at pea size improved the overall yield (Fig. 2).

Plants thinned at pea size, on East and West trellis systems had lower average percentages of black rot than plants thinned at pea size on center trellis system (Fig. 3). Plants growing in the center of the tunnel received less air flow. More research is needed to determine if reduced air flow was a contributing factor to higher average percentages of black rot.

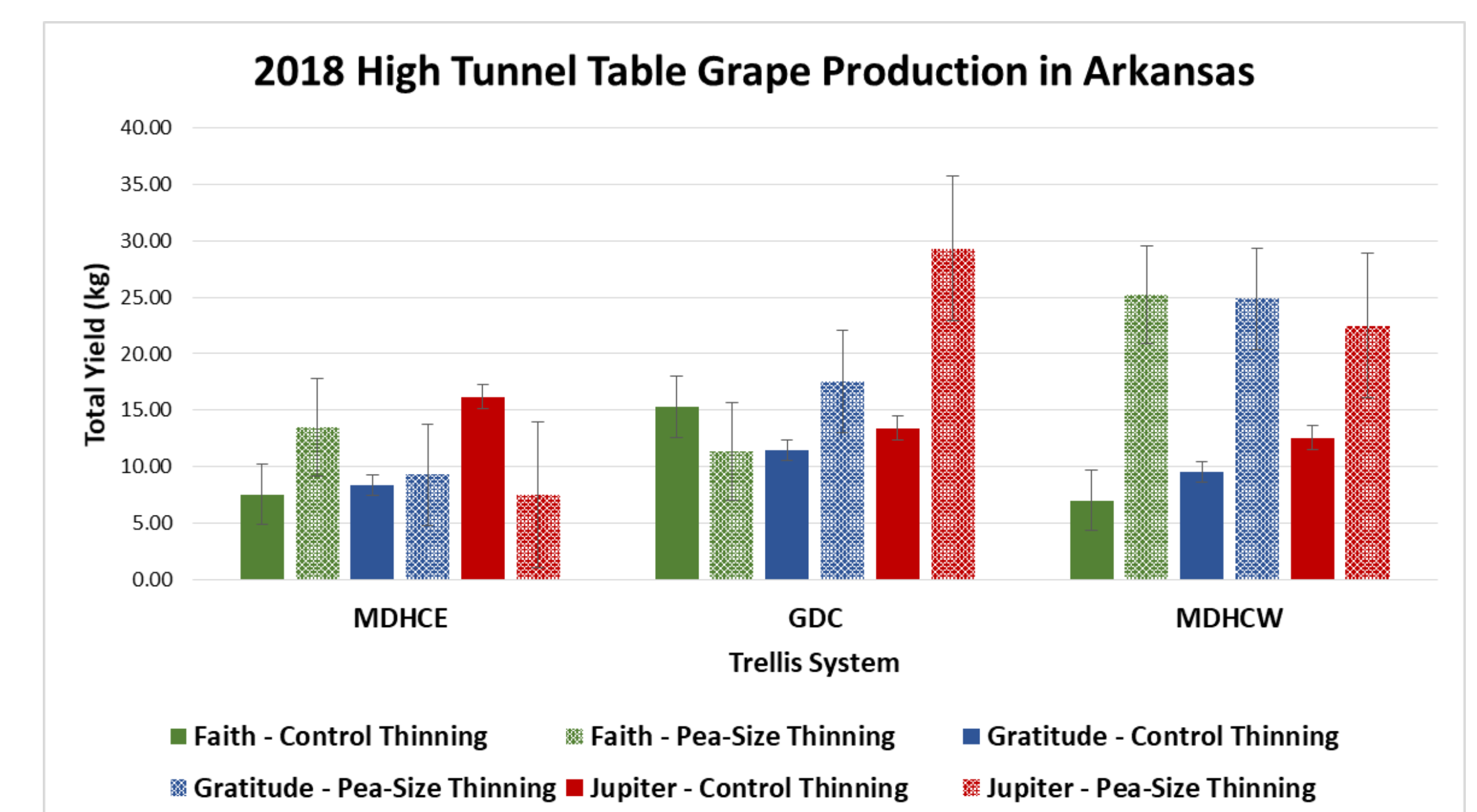


Fig. 2. Total yield of grapes thinned at pea size and control treatments for each cultivar

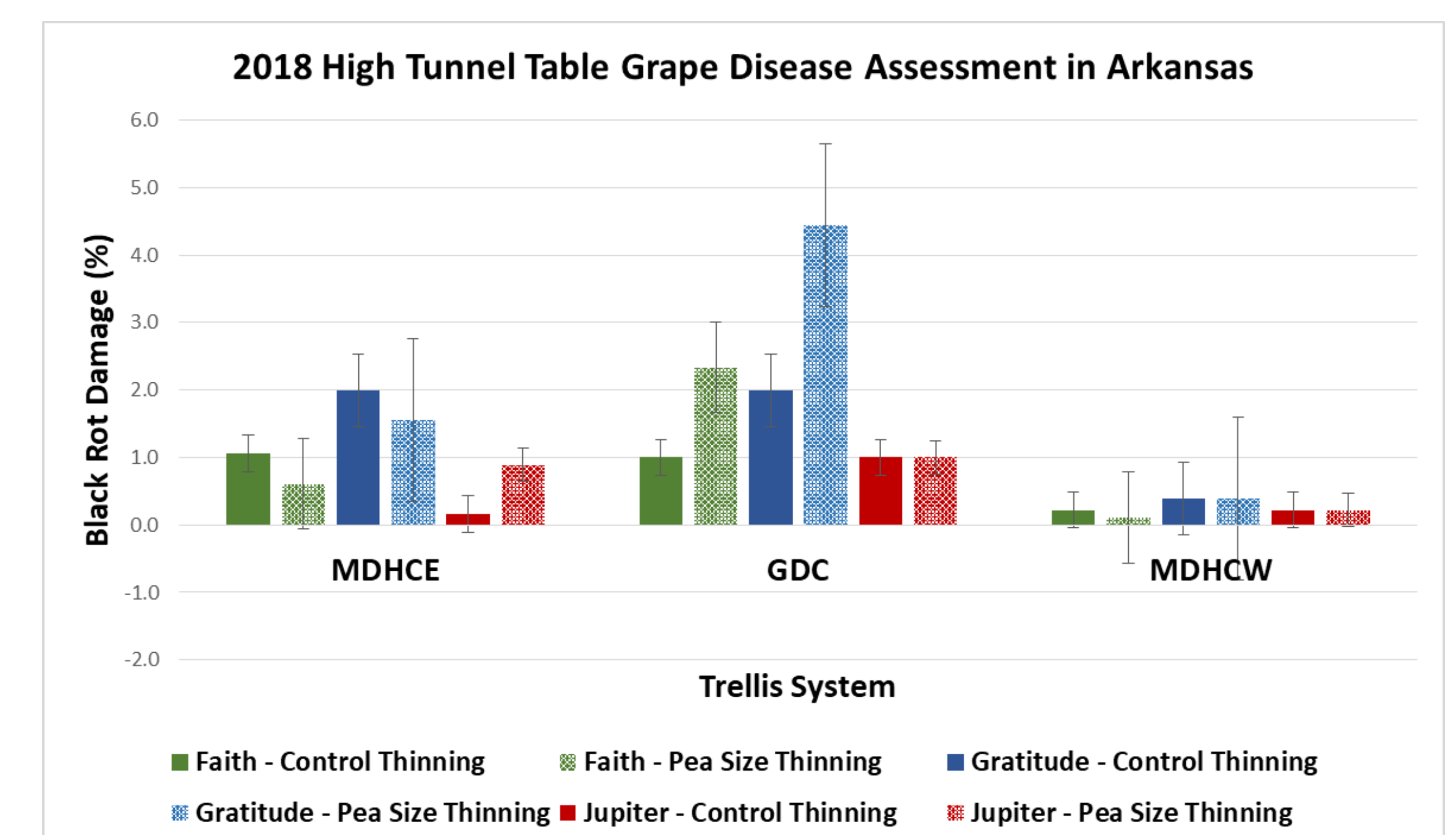


Fig. 3. Average percentage of grapes damaged by black rot between pea size and control treatments for each cultivar

## References

Boriss, Hayley, et. Al. *Commodity Profile: Table Grapes*. Agricultural Issues Center. University of California, 2006