

# **Agricultural Experiment Station Fabian Garcia Science Center**

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## MISSION

The mission of the Fabian Garcia Science Center is to improve the lives of New Mexicans, the nation, and the world through research, teaching and Extension. The center is oriented towards horticultural research.

Fabian Garcia, professor of Horticulture from 1906 to 1945, was named the first director of the State Agricultural Experiment Station in 1913.



The NMSU Onion Breeding program is one of the only two active, public onion breeding programs in the U.S. that is



The first deed for Fabian Garcia Science Center was signed in 1906 and today the center has 41.1 acres of land. The center not only houses the Chili Pepper Institute, but includes, and is not limited to research plots and greenhouses supporting alfalfa breeding and genetics, viticulture, cotton, horticulture, nematology, micro-plot, turf grass water management, IR-4, and onion research. Another greenhouse project occurring is the phytoremediation of contaminated soils.

## **Ongoing Research**

• Contaminated surface soil needs to be remediated. Plants may provide

releasing cultivars and germplasm lines.

The NMSU Alfalfa Breeding and Genetics program currently maintains 500+ greenhouse plants at the Fabian Garcia Science Center.



- a means to extract metals and radionuclides while furnishing cover to reduce erosion and providing bioenergy fuel as oil or biomass. Greenhouse studies were conducted to evaluate the potential of selected (oil)seed crops to extract radionuclides from contaminated soil collected from a former mining site in NM. Researchers found that phytoremediation of radium from soil is possible over long-time scales using canola, hemp, guar, and sunflower with radionuclides partitioned into the seed meal, not the oil.
- Onion stakeholders have identified Fusarium basal rot (FBR) as a serious disease threat to onion yield and economic sustainability. Onion germplasm is being developed and evaluated at the Fabian Garcia Agricultural Science Center that is less impacted by Fusarium basal rot. When inoculated with the disease-causing pathogen, these breeding lines exhibit a lower Fusarium basal rot (FBR) incidence and severity than a commercial FBR-resistant cultivar.



The College of Agricultural, Consumer, and Environmental Sciences is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through academic, research and Extension programs.

#### **Value Added to New Mexico**

- Chile
- Onion
- Cotton

**Nater Use and Conservatio** 

Foundational Education and Training

## **Recent Impacts**

- Onion stakeholders have identified onion thrips and Iris yellow spot (IYS) virus as the greatest pest and disease threats to onion yield and economic sustainability. Onion germplasm is being developed and evaluated at Fabian Garcia that is less impacted by onion thrips and Iris yellow spot. Based upon a conducted economic analysis, onion germplasm resistant to onion thrips and/or IYS could increase profits by \$1,000 per ha per year when compared with current marketable yields and management practices. Based upon the annual hectarage of onions grown in the US, the promising resistant breeding lines from NMSU could increase grower profits for the US industry by \$54 million while also reducing the economic and environmental impact of these production issues and improving the productivity and economic feasibility of this crop for millions of producers worldwide.
- Limited water resources threaten New Mexico's \$153 million alfalfa industry. Researchers at NMSU are working to improve agricultural sustainability and water conservation by developing alfalfa cultivars that can remain productive under optimum and deficit irrigation management strategies. The NMSU Alfalfa Breeding and Genetics program currently maintains 500+ greenhouse plants at the Fabian Garcia Research Center. Seed from these plants is used to establish field research studies that are extensively characterized for nutritional value and yield productivity under deficit irrigation management. DNA is also being isolated from the parent plant tissue and used to develop extensive DNA sequence databases. Integrated analysis of the DNA sequence and field-based data are then conducted to help identify genetic factors influencing drought tolerance and forage nutritive value to develop drought-resilient alfalfa cultivars for the arid southwestern U.S.





## **Community Outreach**

An onion field day was held in Summer 2022 that communicated research results to stakeholders. Topics covered included: breeding for Fusarium basal rot and Iris yellow spot resistance in onion, estimating onion yield loss caused by thrips with high-throughput field photography, improving weed control programs for onions, surveying Mexico onion fields for bacterial diseases, and photosynthesis and physiology of New Mexico grown onions.

### **Fabian Garcia Botanical Gardens:**

The Fabian Garcia Research Center is also home to botanical gardens and a gazebo. This event venue is available for community use and creates a lovely daytime trip for visitors to the Las Cruces area.

### **Fabian Garcia Science Center**

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