INITIATIVE FOR ENHANCEMENT OF RESEARCH AND OUTREACH PROGRAMS AT NMSU'S AGRICULTURAL SCIENCE CENTER AT TUCUMCARI

New Mexico State University's (NMSU) 470-acre Agricultural Science Center (ASC) at Tucumcari has been in continuous operation since 1912 having the most diverse research programs of all of NMSU's research facilities to address local and statewide needs in regard to field crop and livestock production, windbreak and farmstead tree and shrub evaluations, vegetables, and turfgrass. The Advisory Committee to the ASC, composed of local farmers, ranchers, and businesspeople, has identified several programmatic needs for the Tucumcari area that also apply to New Mexico, in general, including Semiarid Cropping Systems; Soil-Plant-Water Quality-Environment Relationships; Range Improvement, Restoration, and Riparian Issues; and Small Landholders Horticulture. To bring about this program enhancement, funding is needed for new PhD level faculty researchers with start-up funding, support staff, and operations.

Semiarid Cropping Systems

In 2013, the New Mexico State Legislature provided funds to NMSU for a Semiarid Cropping Systems Specialist at the ASC. That position was filled in 2014 and the candidate has initiated a research program with multiple projects to address limited irrigation and dryland cropping needs and in early 2015 an Agricultural Research Assistant was hired to support that and existing programs.

The remaining program enhancement initiative, to hopefully be fully funded over the next three years, requests recurring funds for the creation of three additional PhD level faculty positions at the ASC, along with accompanying support personnel, and essential faculty start-up and operating funds.

Soil-Plant-Water Quality-Environment Relationships

Water resource planners, not only in the semiarid American Southwest, but throughout the country and the world, are considering all sources that might be available for any use. Interest is increasing in the possibilities of reusing treated municipal wastewater for agricultural irrigation. According to the New Mexico State Engineer's Office, in 2010, approximately 313,287 acre-feet were used for the public water supply and groundwater discharge permits for municipality wastewater treatment facilities (WWTF) in New Mexico totaled over 100,000 acre-feet. While reuse of treated municipal wastewater will not come close to meeting the state's total water use, it could make a significant impact in reducing the amount of the public water supply that is being used for irrigation.

A $1.75 million New Mexico Water Trust Board grant and loan to the City of Tucumcari WWTF led to a 20-year contract with the City of Tucumcari for NMSU to purchase of 300 acre-feet per year of wastewater and the installation of two additional center pivot irrigation systems, thereby increasing sprinkler irrigation capacity from 35 to 85 acres with two additional valves for future expansion at the ASC to develop research programs related to the reuse of treated municipal wastewater for agricultural irrigation.

The Soil-Plant-Water Quality-Environment Relationships faculty member at the ASC will conduct a research and outreach program related to plant stresses and soil and environmental impacts when using quality-impaired water sources for agricultural irrigation in semiarid regions,

including recycled treated municipal wastewater. Other projects related to regional agricultural production will be conducted as needed, particularly, toward reduced irrigation as well as precision agriculture. **To fund this program, $237,000 of recurring funds for the faculty member, a research assistant, and operations and $50,000 of non-recurring funds for a start-up package are requested in FY2020-21.**

Range Improvement, Restoration, and Riparian Issues

Eighty-nine percent of the agricultural land in New Mexico is classified as rangeland, which have been the backbone of New Mexico agriculture for more than a century with annual cash receipts for grazing livestock, mostly beef cattle and sheep, which are primarily raised on rangelands, approaching $1 billion in New Mexico before the current drought. Much of the beef cattle production occurs in the eastern half of the state where the Agricultural Science Center at Tucumcari is centrally located. Producers and agricultural professionals (e.g., scientists, Extension, NRCS, private consultants) alike share concerns about the sustained productivity of rangelands. In many cases, extended periods of drought and continuous grazing have contributed to the alteration of rangelands, such that the productivity of large areas is suppressed, undesirable plant species have invaded and are outcompeting native vegetation for water, and soil erosion has increased.

The Range Improvement, Restoration, and Riparian Issues faculty member will develop a research and outreach program to assist range managers with grazing systems, range and pasture improvement, invasive species control, and riparian restoration in semi-arid watersheds. Although a significant component of activity will be on cooperator land, this faculty member will be based from the Agricultural Science Center at Tucumcari and have access to the staff and facilities at the ASC. **To fund this program, $258,000 of recurring funds for the faculty member, 1 research assistant, a farm supervisor, and operations and $50,000 of non-recurring funds for a start-up package are requested in FY2021-22.**

Small Landholders Horticulture

In the past decade there has been a shift in farm sizes throughout New Mexico such that many landholders operate with less than 20 acres, especially those in close proximity to urban centers, but also in rural areas such as Tucumcari. Many of these landholders are interested in producing maximum yields of food for local consumption and exportation to urban centers with minimal input. A significant number are new to agriculture and desire information about innovative production practices that are applicable to their situation. The Small Landholders Horticulture faculty member will develop a research and outreach emphasis to assist small landholders in maximizing productivity of horticultural crops with limited resources, particularly limited irrigation capacity and alternative fertilizer sources, as well as new crops. They also will evaluate the possibility of using treated municipal wastewater for human food production. This is a concept in which the US EPA and US FDA has become interested. **To fund this program, $245,000 of recurring funds for the faculty member, 1 research assistant, a farm laborer, and operations and $50,000 of non-recurring funds for a start-up package and $50,000 of non-recurring funds are requested in FY2022-23.**

The Advisory Committee to the NMSU's Agricultural Science Center at Tucumcari supports appropriation of recurring funds to the Agricultural Experiment Station and Cooperative Extension Service for other activities as well.