Effect of Storage Time and Harvest Season on Transplant Success of Bermudagrass and Zoysiagrass Sod
$79,460.00

Poor transplant success is a common occurrence while transporting turfgrass sod to distant markets or stored for an extended duration in pallets. Most previous studies have focused on identifying the shelf-life and transplant success of cool-season turfgrass sod. Warm-season turfgrasses such as bermudagrass and zoysiagrass are commonly grown in Oklahoma. The potential risk of poor transplant success due to internal heating or desiccation holds back sod producers here to deliver to distant markets. Oklahoma State University researchers in the Department of Horticulture and LA will identify the effect of five storage times (0, 24, 48, 72, and 96 hours after harvest) and three harvest seasons (late spring, mid-summer, and late summer) on the transplant success of bermudagrass and zoysiagrass sod rolls/slabs stacked in pallets. The internal temperature and moisture level will be measured for each sod before transplanting to quantify the magnitude of internal heating and desiccation. The transplant success based on green cover will be evaluated using visual ratings, digital image analysis software and Canapeo app. Stakeholder discussion groups will be utilized to understand the current post-harvest handling and storage conditions followed for bermudagrass and zoysiagrass sod. Results will be disseminated through field days, professional association meetings, and extension programming. Identifying the optimum storage time for a specific harvest season will be valuable information for sod producers. This information would reduce excess waste, deterioration in quality, and even product failure, if the turf is not laid within the required time after harvesting or while transporting to distant markets.

Canopy Management of Pecan Trees for An Earlier Reproduction Recovering from Ice Storm Damage
$99,184.00

Scientists at Oklahoma State University (OSU) will study the canopy recovery of pecan trees damaged by ice storms to accelerate the recovery toward reproduction. Ice storms often result in catastrophic damage of pecan orchards and improper canopy management will delay return to tree productivity resulting in devastating economic loss. Research-based information on canopy management after severe canopy loss is lacking. Expectations for return bloom and production timing are not fully understood on trees containing different proportions of damaged and undamaged limbs, and how productivity is impacted when a large number of epicormic shoots sprout from the broken limbs. Nitrogen and zinc fertilization are major factors affecting production recovery; however, no research or guidance has been developed to adjust fertilization. This research will focus on studying return bloom of trees at different levels of canopy loss, investigate the correlation between return bloom and carbohydrate levels on damaged trees and develop protocols for epicormic shoot pruning and fertilizer (nitrogen and zinc) adjustment to accelerate return bloom and reproductivity. The result of this research can also be used in the canopy recovery of other types of weather damage such as tornadoes and thunderstorms.

Doubling The Production And Marketing Seasons For Broccoli, Snap Beans And Asparagus In Oklahoma
$99,817.00

Scientists at Oklahoma State University's Horticulture and L.A. Department will combine their expertise and resources in small farm vegetable production and harvesting, handling and objective measurement of quality to devise systems for producing high-quality broccoli, snap beans, and asparagus in their conventional and their alternate production seasons in Oklahoma. This project seeks to double production and marketing opportunities for small farm vegetable producers, identifying varieties which perform best for conventional and "off-season" production in terms of yield, visual quality, ability to withstand the rigors of handling after harvest and provide consumer satisfaction with a "fresh" flavor. We will evaluate field establishment timing as a means to extend the production season in early or late seasons of production. Less costly asparagus establishment methods will be compared to conventional methods in terms of plant performance and duration to initiation of harvest. Results will be extended to stakeholders at field day demonstrations, at grower conferences, through written proceedings/refereed publications, and through Extension publications. Our results will de-mystify off-season broccoli, snap bean, and asparagus production systems, providing a roadmap for enhancing vegetable offerings by our small farm vegetable producers. Since 94% of all farms are small farms in Oklahoma, we believe we are targeting the correct segment of Oklahoma agriculture.

Investigation Of Hops (Humulus Lupulus) As A New Oklahoma Specialty Crop
$99,569.00

Scientists at Oklahoma State University's Horticulture and L.A. and Biosystems and Agricultural Engineering Departments will combine their expertise and resources in new crop production and harvesting, handling and objective measurement of quality to devise systems for producing hops in field and greenhouse production systems in Oklahoma. This project seeks to install a new crop into Oklahoma's specialty crop portfolio and as such increase hops production from essentially 0 to the number of acres needed to meet the demand of our growing $699 million craft beer industry. To decrease overall harvesting cost, we also propose to design and fabricate a mid-range harvester (70-90 bines per hour), between the cheapest harvester (30-60 bines per hour; $14,000-$15,000 retail cost) and the next available harvester (about 120 bines per hour; $30,000 to $35,000 retail cost), with a retail cost close to the smaller harvester. Cooperation with Oklahoma craft breweries to place Oklahoma hops within quality parameters for the hops they presently use should bridge the marketing gap and provide fair market price for the new Oklahoma crop. Results for hops production will be disseminated at field days, grower meetings and through new fact sheets. Placement of Oklahoma hops within the quality spectrum of hops in current use will be communicated to craft breweries individually and through communications via the Craft Beer Association of Oklahoma.

Enhancing Specialty Crop Competitiveness In OK Through Replicated Aquaponic Research Systems At OSU
$88,076.00

Oklahoma State University and Symbiotic Aquaponic, LLC will create a partnership that will build and establish seven replicated media bed aquaponic systems. Specialty crop competitiveness will be enhanced through research conducted by OSU on these systems that provides valuable data and knowledge regarding specialty crop productivity within media bed

aquaponic systems. These systems will serve as hands-on tools that will allow scholars, researchers, and graduate and undergraduate students to conduct meaningful research that focuses on improved efficiency, increased food security, and increased human nutrition, knowledge, and consumption of specialty crops produced in aquaponic systems. If funded, this project will conduct studies (in-vitro and in-situ) evaluating optimal planting densities according to nutrient inputs for four different specialty crops grown in the replicated media bed aquaponic systems. These four specialty crops will be: 1) Dinosaur Kale (Brassica oleracea var. palmifolia); 2) Banana Pepper (Capsicum annuum 'Banana Pepper'); 3) Pole Bean (Phaseolus vulgaris); 4) Cilantro (Coriandrum sativum). Research results will be available to students at OSU, Pawnee Nation College (through the Pawnee Gardner Program), Murray State College, aquaponic growers, and other stakeholders via tours, workshops, and publications. To amplify the dissemination of information, OSU will rely on Symbiotic Aquaponic to connect with aquaponic growers in Oklahoma and across the nation. Symbiotic Aquaponic is a well-known aquaponics organization based in Oklahoma with an extensive network of practitioners. After the conclusion of this grant (01/14/2024), OSU plans to continue their work in aquaponics through partnerships with aquaponic producers, workforce initiatives, curriculum building, and student (undergraduate and graduate) research programming.

Precision Irrigation to Improve Water Use Efficiency in Production of Ornamentals, Vegetables, and Turfgrass
$85,523.00

As input costs continue to increase, growers are looking for simple solutions to increase production or plant quality without having to make big changes to their production. Research at Oklahoma State University will evaluate use of soil moisture sensors for precision irrigation for ornamental, vegetable, and turf production. Growers typically make irrigation decision by looking at a crop. Knowing that plant growth is directly correlated to available water throughout production, automated irrigation technology has begun to be adopted. In addition, scarcity of water resources and cost has driven growers to consider more sustainable practices and to increase water use efficiency. This research will evaluate multiple species across three different specialty crop groups. Quantitative data on water use efficiency and plant growth will be used to make a recommendation on the value of using tensiometers to schedule irrigation based on pant needs. Outcomes include providing information on tensiometer settings that could be used to increase production efficiency in terms of plant growth and reduced inputs. Information will be provided to stakeholders through a factsheet, journal publication, site visits, and word of mouth of those supporting growers that will do on farm evaluations too. Tasks to be completed include installing tensiometers, running experiments, data collection on growth parameters, and disseminating results.