SOUTHEAST PURDUE AGRICULTURAL CENTER
RESEARCH AND DEMONSTRATION PROJECTS
2019

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Soil Drainage and Water Quality

Long-term project to determine:
1) The effect of tile drain spacing on corn and soybean yields on a Clermont soil
2) The movement of nitrates into drainage water under typical management practices

Eileen Kladivko, Agronomy

CSCAP Cover Crop effects on corn and soybean production

Measurement of cereal rye crop growth and subsequent effects on corn and soybean growth and yield. Determine if a historical cereal rye growth can provide nitrogen credit to corn crop.

Eileen Kladivko, Daniel Welage, Bob Nielsen, Jim Camberato, Agronomy

Long-term drainage and soil hydraulic conductivity and infiltration rates

Measure hydraulic conductivity and infiltration rates

Eileen Kladivko, Daniel Welage, Agronomy

Long-term drainage and soil structure development

Measure soil structural differences at different distances from tile drains to determine genesis of flow paths and changes in structure resulting from drainage system maturation over thirty- five years

Eileen Kladivko, Jason Adams, Daniel Welage, Kevin Mitchell, Agronomy
Daniel Hirmas University of California Riverside
Dena Anderson, NRCS

Assess the nitrogen contributing capabilities of various leguminous cover crops to subsequent corn crop

Early season establishment of a variety of cover crop species followed by corn crop with various levels of synthetic nitrogen treatments

Eileen Kladivko, Agronomy
SEPAC staff

Effectiveness of Annual Ryegrass to mitigate negative effects of fragipan soils

Establishment of annual ryegrass on fragipan soils and measure yield differences in corn and soybean with no ryegrass. Measure fragipan depths overtime.

Lloyd Murdock, University of Kentucky
Dena Anderson, NRCS
SEPAC staff

Corn Response to In-furrow & Sidedress Applications of Sulfur Fertilization

Evaluate corn response to sulfur fertilization.

Bob Nielsen and Jim Camberato, Agronomy

Corn Responses to Applied Boron

Evaluating corn responses to sidedress-applied boron fertilizer

Bob Nielsen and Jim Camberato, Agronomy

Comparison of In-Furrow and 2X2 Starter Fertilizers on the Growth, Development, and Yield of Continuous Corn

Evaluate corn response to various starter placements, rates and products in a continuous corn environment

Bob Nielsen, Jim Camberato, Agronomy

Soybean Variety Performance Trial

State variety performance trials.

Phil DeVillez and Bill Foster, Agronomy

Corn Hybrid Performance Trial

State variety performance trials.

Phil Devillez and Bill Foster, Agronomy

Indigenous Soil Potassium Supply, Fertilizer Potassium Use Efficiency, and Potassium Budgets in Indiana Corn and Soybean Production

Evaluate the agronomic efficiency of currently recommended potassium fertilizer rates

Alex Helms SEPAC, Jim Camberato, Agronomy

Soybean Response to Sulfur Fertilization and other Foliar Applications

Evaluate soybean response to granular and foliar applications of AMS fertilization at various growth stages. Evaluate fungicide and insecticide foliar treatments.

Shaun Casteel, Agronomy

UAV plant stand assessments of Soybean Seeding Rate Trial Crossed by Plant Type

Evaluate and fine tune soybean planting rate recommendation

Develop UAV scouting protocols.

Shaun Casteel, Richard Smith, Agronomy

Soybean Response to Sulfur Fertilization in high carbon environments

Evaluate soybean response to granular applications of sulfur forms in high corn and cereal rye residues

USDA-ARS Northern Soybean Uniform Test

Evaluate USDA-ARS Northern Uniform Soybean Test strains grouped by maturity for comparison and seed increases.

Gary Nowling, USDA-ARS

Corn Response to Cereal Rye Cover Crop and Starter Fertilizer Interaction

Evaluate corn response to cover crop and starter fertilizer treatments

Shalamar Armstrong and Houston Miller, Agronomy

Field Scale Fungicide Timing in Corn

Fungicide applications at different timings and observe crop diseases throughout the growing season. Evaluate corn response to treatments.

Darcy Telenko, Jefferey Ravellette, Botany and Plant Pathology

Field Scale Fungicide Timing in Soybean

Fungicide applications at different timings and observe crop diseases throughout the growing season. Evaluate soybean response to treatments.

Darcy Telenko, Jefferey Ravellette, Botany and Plant Pathology

Corn and Soybean Sentinel Plots

Establishment of susceptible hybrids for observation of various disease presence and severity throughout the growing season

Darcy Telenko, Jefferey Ravellette, Botany and Plant Pathology

FFA Profit Plots

Educational outreach to local FFA programs to demonstrate corn and soybean production systems, marketing and research protocols

19-SEPAC-Soy-05 Herbicide Trial

Xtend soybean system comparison – no-till.

Bill Johnson, Botany & Plant Pathology

19-SEPAC-Soy-09 Herbicide Trial

ISA Soybean Systems Demonstration

Bill Johnson, Connor Hodgskiss, Wyatt Peterson, Botany & Plant Pathology

Hodgskiss Cover crop trial with cereal rye crimson clover

Comparing Xtend and Enlist systems with cover crop termination

Bill Johnson, Conner Hodgskiss, Botany & Plant Pathology

Peterson Cover crop trial 1 Weed Control with Cereal Rye/Oats/Radish/Fallow

Compare cover crop weed control in cereal rye vs. oats/radish vs. fallow with different herbicide treatments in corn

Bill Johnson, Wyatt Peterson, Botany & Plant Pathology

Peterson Cover crop trial 2 Termination Timing Effect on Corn

Compare different cover crop termination timings of cereal rye, cereal rye/crimson clover and crimson clover for effects on corn establishment and yield

Bill Johnson, Wyatt Peterson, Botany & Plant Pathology

Long Term Growth Regulator Study_SEPAC

Effects of Growth Regulator Herbicide Technology Dependency in a Corn and Soybean Rotation.

Bill Johnson, Dustin Johnson, Botany & Plant Pathology

Cooperative Ag Pest Survey (CAPS) for exotic insect pests of soybean corn and oak
Installation and monitoring of a trap array for exotic insect pests as part of a statewide survey network
Larry Bledsoe, Entomology

Corn Earworm Pheromone Trapping
To monitor the presence of corn earworm moths.
John Obermeyer, Entomology

Black Cutworm Pheromone Trapping
To monitor the presence of black cutworm moths.
John Obermeyer, Entomology

Armyworm Pheromone Trapping
To monitor the presence of armyworm moths.
John Obermeyer, Entomology

Soybean Aphid Suction Trap
To monitor the presence of soybean aphid.
Dave Voegtlin, National Soybean Research Center

Specialty Crop Research Initiative (SCRI) Impact of neonicotinoid insecticides on honey bee pollinators of melons
The within and surrounding field impacts of neonicotinoid insecticides on honey bees.
Laura Ingwell, Ian Kaplan, Christian Krupke, Jacob Pecenka, Entomology

Specialty Crop Research Initiative (SCRI) Impact of neonicotinoid insecticides on cucumber beetle natural enemy communities
Effect within and surrounding field impacts of neonicotinoid insecticides on cucumber beetle natural enemy populations
Steve Yaninek, Amanda Skidmore, Ivan Grijalva and Louisa Panado, Entomology

Role of symbiotic microbes in the transmission of insect-vectored plant pathogens
Investigate potential of bacterial communities associated with aphids and influence of Barley yellow dwarf virus
Laramy Enders, Laura Ingwell and Brandon Schemerhorn, Entomology

Evaluating vacuum stream treatment as an alternative to methyl bromide for killing the oak wilt fungus in logs from wilted red and white oak trees

Evaluate vacuum steam treatment as a viable alternative to methyl bromide

Ron Mack USDA, Mark White Virginia Tech University, Zhangjing Chen Virginia Tech University, Anna Yang University of Minnesota, Jenny Juzwick US Forest Service, Paul Castillo US Forest Service, Phil Marshall Indiana DNR, Don Carlson Forestry & Natural Resources

Forest Insect Pest Monitoring

Establish annual insect sampling sites to monitor the spread of new and ongoing forest insects involved in the establishment and spread of forest pests and diseases

Phil Marshall, Indiana DNR

Bacterial Leaf Scorch Disease monitoring

Monitor the spread and impacts of bacterial leaf scorch disease in a red oak provenance planting. Evaluate disease compared to red oak genetics from all regions of its native range.

Phil Marshall, Indiana DNR, Jenny Juzwic, US Forest Service, Matt Ginzel, Jim McKenna, Hardwood Tree Improvement & Regeneration Center

Edge Feathering

Implementation of edge feathering management practices around wooded field borders for increased wildlife habitat and evaluation of crop yield response to the practice

Jarred Brooke, Don Carlson Forestry & Natural Resources – SEPAC staff

Controlled Burn Management for Oak Regeneration

Evaluate the of effectiveness of utilizing controlled burn as a management strategy to increase oak species competitiveness in a regeneration site

Jarred Brooke, Don Carlson Forestry and Natural Resources

Warm Season Grass Plantings

Establishment of warm season grasses and forbs for demonstrating various management techniques and plant identification education

Jarred Brooke, Forestry and Natural Resources

Wildlife Food Plots

Demonstration of seeding techniques, establishment, and management of various beneficial plant species for wildlife

Jarred Brooke, Forestry and Natural Resources

Biomass Harvest Site Demonstration Tree Planting

Four, two-acre planting sites with four treatments and half of the acreage fenced.

Don Carlson, Forestry & Natural Resources

Woody Biomass Removal Study -2012

Harvest a woody biomass to document the economic returns and ecological impacts from varying woody biomass retention levels. Maintained as a demonstration and extension education site

Mike Saunders and John Dunning, Forestry & Natural Resources

Don Carlson, Forestry and Natural Resources

Characterizing abiotic and biotic tree stress using hyperspectral information - Started 2019

Incorporating digital approaches into forest monitoring and management to potentially mediate the negative impact of stressors on forests.

John Couture Entomology, Doug Jacobs, Forestry and Natural Resources

Screening Butternut for Resistance to Butternut Canker Disease - Started 2011

To evaluate butternut canker disease.

Jim McKenna and Brian Beheler, Hardwood Tree Improvement & Regeneration Center

Ecological Fitness and Comparison of Pure and Hybrid Butternut - Started 2011

Evaluate butternut from all over the native range as well as hybrids and pure lines from the SEPAC orchard.

Jim McKenna and Brian Beheler, Hardwood Tree Improvement & Regeneration Center

Pure Butternut Seed Orchard of New Clones Resistant to Butternut Canker – Started 2011

Orchard seed production.

Jim McKenna and Brian Beheler, Hardwood Tree Improvement & Regeneration Center

Butternut Test - Started 2010

Evaluate butternut from all over the native range as well as hybrids and pure lines from the SEPAC orchard.

Jim McKenna and Brian Beheler, Hardwood Tree Improvement & Regeneration Center

Limited Range Provenance Test of Black Cherry – Started 2006

First year test in Southern Indiana of a limited range provenance (common garden) test to evaluate black cherry seedlings collected from the Allegheny National forest in Northwestern Pennsylvania in comparison to northern and southern Indiana sources along with seedlings from selections in an IDNR seed orchard with other plots in Central Indiana and Southern Michigan 50 miles north of the Indiana border.

Phil O'Connor, Indiana Department of Natural Resources; Jim McKenna, Keith Woeste, Hardwood Tree Improvement & Regeneration Center

Mass Selection of Butternut for Resistance to Butternut Canker from a Range-Wide Collection – Started 2005

Evaluation of Butternut seedlings collected throughout the native range of butternut from resistant individuals for future breeding and development of Butternut Canker resistant germplasm.

Jim McKenna, Keith Woeste, Hardwood Tree Improvement and Regeneration Center

Mass Selection of Butternut for Resistance to Butternut Canker from a Wisconsin Forest – Started 2004

Evaluation of Butternut seedlings from a wood lot in Wisconsin where a large population of Butternut trees with resistance to the butternut canker fungus are growing.

Jim McKenna and Keith Woeste, Hardwood Tree Improvement & Regeneration Center

Butternut Resistance Test – Started 2004

A test of susceptible, moderately resistant and resistant butternut seedling families for resistance to butternut canker disease.

Jim McKenna and Keith Woeste, Hardwood Tree Improvement & Regeneration Ce

Butternut Resistance Seed Orchard – Started 2001

Grafted butternuts from resistant selections from Southern Illinois University (Carbondale) to be used for future breeding of resistant butternut along with own-rooted cuttings from butternut seedlings.

Keith Woeste, Paula Pijut, and Jim McKenna, Hardwood Tree Improvement and Regeneration Center; Mike Ostry USDA-Forest Service -Northern Research Station; John Seifert, Indiana Department of Natural Resources

Progeny Test of Black Walnut Families for Timber Production via Sprouted Seed - Started 2004

Evaluation of select black walnut families for vigor and timber quality using sprouted seed as a means of better controlling variables such as initial seedling size and to make grid-planting easier and more economical

Jim McKenna and Keith Woeste, Hardwood Tree Improvement & Regeneration Center

Effect of Genotype and Seedling Size on Early Walnut Plantation Performance

Test walnut seedlings from 9 diverse mother trees grown at 3 different planting densities in the IDNR State Forestry Nursery for out-planting survival and growth.

Jim McKenna and Doug Jacobs, Hardwood Tree Improvement & Regeneration Center

Limited Range Black Cherry Provenance Test – Started 2007

Second year test in Southern Indiana of a limited range provenance (common garden) test to evaluate Black Cherry seedlings collected from the Allegheny National forest in north western Pennsylvania in comparison to northern and southern Indiana sources along with seedlings from selections in an IDNR seed orchard. Other plots are in Central Indiana and Southern Michigan 50 miles north of the Indiana border.

Jim McKenna, Keith Woeste, Forestry & Natural Resources; USDA Forest Service, National Forest - Region 9; Phil O'Connor, Indiana Department of Natural Resources

Red Oak Progeny Test – Started 2008

The beginning of a northern red oak improvement program using genetic testing of select northern red oak seed trees.

Keith Woeste, , Keith Woeste and Jim McKenna, Forestry & Natural Resources; Phil O'Connor, Indiana Department of Natural Resources

Red Oak Progeny Test – Started 2008

Ongoing testing of select northern red oak seed trees.

Keith Woeste, and Jim McKenna, Forestry & Natural Resources; Phil O'Connor, Indiana Department of Natural Resources

Black Walnut Progeny Test – Started 2008

Ongoing genetic improvement of select black walnut seed trees to develop improved walnut seed sources for Indiana and the Midwest.

Keith Woeste, and Jim McKenna, Forestry & Natural Resources

Deer Fencing, Select Genetics, & Slow-Release Fertilizer Mixed Hardwood Plantation – Started 2008

Demonstration of research results that have shown improvement in tree growth and form utilizing deer fencing, select genetic stock, and fertilizing with slow-release fertilizer at the time of planting with each main factor being tested in large blocks to demonstrate their applied application with species including northern red oak, white oak, black walnut & cherry.

Don Carlson, Jim McKenna, Lenny Farlee, Mike Saunders, Doug Jacobs, and Keith Woester, Forestry & Natural Resources; Phil O'Connor and Bob Hawkins, Indiana Department of Natural Resources

Red Oak Progeny Test – Started 2009

Ongoing genetic improvement of select black walnut seed trees to develop improved northern red oak seed sources for Indiana and the Midwest.

Keith Woeste, and Jim McKenna, Forestry & Natural Resources; Phil O'Connor, Indiana Department of Natural Resources

Black Walnut & Northern Red Oak Container-grown vs. Bare-Root Nursery Grown Stock – Started 2009

Assess the performance of containerized grown tree seedling to determine uniformity, year-to-year consistency and lower cost of planting of red oak and black walnut.

Lenny Farlee, Keith Woeste, Don Carlson, and Jim McKenna, Forestry & Natural Resources; Anthony Davis, University of Idaho

Purdue Continuous Forestry Inventory Plots

Maintain forestry inventory data from all forested compartments

Don Carlson, Forestry & Natural Resources

Oak Wilt Management

Monitoring of forested compartments to detect and asses oak wilt outbreaks in red oak stands. Confirmed infected stands will be salvaged at the appropriate times to contain or eradicate the disease.

Don Carlson, Forestry and Natural Resources

Timber Stand Improvement

Conducted as necessary on forested compartments and tree plantings to maximize forest productivity and maintain forest health.

Don Carlson, Forestry and Natural Resources

Timber Sales and Harvesting

Management of timber resources in conjunction with forest management plans and FNR policies. Standing timber is marked, advertised and sold via sealed bid sales. FNR and SEPAC staff do conduct some timber harvesting to address salvage, research, extension or other unique situations presented.

Don Carlson, Forestry and Natural Resources & SEPAC Staff

Invasive Plant Control

Control of non-native invasive plants (IPs) in forested areas. Controlled IPs include: Asian bush honeysuckle, multi-flower rose, autumn olive, Japanese honeysuckle, Tree of Heaven (ailanthus), Japanese stilt grass, common buckthorn, reed canary grass, Japanese barbary, wintercreeper, privet, periwinkle, burning bush, Johnson grass.

Development of boundary identification and GIS mapping of infestations.

Don Carlson, Forestry and Natural Resources