SAES-422 Multistate Research Activity Accomplishments Report

Project No. NC 140 and Title: Improving Economic and Environmental Sustainability in Tree-Fruit Production Through Changes in Rootstock Use

Period Covered: Oct. 1, 2017 to Sept 30, 2018

Annual Meeting Dates: November 14-15, 2015, Mills River, NC

Publications

Refereed Journal Articles

Symposium Proceedings


Poster Presentations

- Schupp, J., H. E. Winzeler, and M. A. Schupp. 2018. NC 140 peach rootstock trial. Mid Atlantic Fruit and Vegetable Conference, Hershey, PA.
- Schupp, J., E. Winzeler, M. Schupp, and L. Kime. 2018. Pruning by the numbers. Mid Atlantic Fruit and Vegetable Conference, Hershey, PA.
- Schupp, J., E. Winzeler, and M. Schupp. 2018. Effects of rootstock and tree spacing in mineral nutrition and productivity of peach trees in Pennsylvania. Mid Atlantic Fruit and Vegetable Conference, Hershey, PA.
• Winzeler, H. E., and J. Schupp. 2018. Use of Ethephon and 1-MCP in the harvest and storage of Manchurian crabapples. Mid Atlantic Fruit and Vegetable Conference, Hershey, PA.

Published Abstracts

Technical Reports/Commercial Industry Reports

Extension Fact Sheet Publications

Popular Articles

Other Creative Works
• Moran, R. Website – Plum Production in Maine, https://extension.umaine.edu/publications/2034e/
• Crassweller, R. 2018. Climate & Orchards – Part 1. What changes have already occurred https://extension.psu.edu/climate-change-and-orchards-part-1-what-changes-have-already-occurred
• Schupp, J. 2018. Is it okay to concentrate chemical thinners? https://extension.psu.edu/is-it-okay-to-concentrate-chemical-thinners

**Plant Patents**

Scientific and Outreach Oral Presentations

- Bradshaw, T. 2018. Constraints & Opportunities for Selling Apples to the Cider Market. UVM Apple Program
- Cochran, D.R. NC-140 ‘Honeycrisp’ rootstock trial update 2018. Iowa State University Fruit and Vegetable and Vegetable Growers Field Day, Horticulture Research Farm, IA.
- Evans, K. 2018. Pear rootstock breeding. International Pome Fruit Alliance
- Fallahi, E. 2018. We had a daylong educational tour in Parma, Idaho and showed growers how to design the new tree architectures and training in several rootstocks to commercial apple growers of Idaho (38 growers participated).
- Fallahi, E. 2018. Results of 2010 and 2014 NC-140 apple rootstocks. Utah Horticulture Convention, Salt Lake City, UT.
- Fallahi, E. 2018. Results of rootstock performance in Fuji and Honeycrisp. Idaho State Horticultural Society Summer Tour. 57 participants
- Fallahi, E. 2018. Participated a ½ day educational tour at Parma Research Center where results of our rootstock performance trials. 530 participants
- Fallahi, E. 2018. Impacts of various rootstocks on yield and fruit size. Idaho apple growers, Parma, Idaho
• Kon, T.M. 2018. Effects of 6-BA and NAA on fruit set, fruit growth, and yield of 'Gala' in North Carolina. Northeast Plant Growth Regulator Working Group, Wilkes Barre, PA
• Kon, T.M. 2018. Minimizing stem end splitting of 'Gala': Effects and interactions of AVG and GA4+7. Northeast Plant Growth Regulator Working Group, Wilkes Barre, PA
• Kon, T.M. 2018. Effect of AVG formulation and application number on preharvest drop control and fruit quality of 'Red Delicious' apples. Northeast Plant Growth Regulator Working Group, Wilkes Barre, PA
• Kon, T.M. 2018. Inducing lateral branching and shoot extension of 'Gala' apple with chemical and cultural practices. Northeast Plant Growth Regulator Working Group, Wilkes Barre, PA
• Kon, T.M. 2018. Developing a horticultural research and extension program for the southeastern apple industry, North Carolina State University Department of Horticultural Science Seminar Series, Raleigh, NC.
• Kon, T.M. 2018. Apple Thinning Update. Apple Production Twilight Meeting, Richmind Orchards, Flat Rock, NC
• Kon, T.M. 2018. Early Season & Preharvest Plant Growth Regulator Applications. Apple Growing Updates, Rockingham County Agricultural Center, Reidsville, NC
• Kon, T.M. 2018. Early Season Plant Growth Regulator Applications. Northwest Winter Tree Fruit Meeting, Wilkes County Agricultural Center, Wilkesboro, NC
• Kon, T.M. 2018. Early Season & Preharvest Plant Growth Regulator Applications. 2018 North Georgia Apple Production Meeting, Gilmer County Library, Ellijay, GA
• Kon, T.M. 2018. Apple Tree Pruning Workshop. Transylvania County Master Gardeners Program, Mountain Horticultural Crops Research and Extension Center, Mills River, NC
• Kon, T.M. 2018. Apple Tree Pruning. Apple Field Day, Georgia Mountain Research and Education Center, Blairsville, GA.
• Kon, T.M. 2018. Early Season Plant Growth Regulator Applications. Western District Winter Apple School, Hendersonville, NC
• Kon, T.M. 2018. Plant Growth Regulator Applications in Apple Production. Master Pomologist Program, Henderson County Extension Office, Hendersonville, NC
• Kon, T.M. 2018. Managing fruit quality and preharvest drop. Southeastern Apple Growers Meeting, Asheville, NC
• Minas I.S., D. Sterle D., and F. Blanco-Cipollone. 2018. Near infrared spectroscopy can nondestructively assess the effect of rootstock, crop load and canopy position on peach fruit harvest maturity and internal quality. 30th International Horticultural Congress, ISHS, Istanbul, Turkey.
• Muehlbauer, M. et al. 2018. A total of 6, 4 hour workshops with handouts were held with Master Gardeners to educate them about the NC-140 rootstock plantings at the Rutgers University Snyder Research and Extension Farm, Pittstown, NJ.
• Muehlbauer, M. et al. 2018. An additional 2 hour workshop with handouts was held with high school students to educate them about the NC-140 rootstock plantings at the Rutgers University Snyder Research and Extension Farm, Pittstown, NJ.
• Musacchi, S, K. Evans, and S. Serra. 2018. WA 38 Fall Field Visit Rootstock trial – Sunrise (Rock Island). 100 people attended the field day.
• Parker, M.L. January 2018. Peach Production Orchard Tour and Workshop with an emphasis on peach rootstocks and subsequent management. Sandhills Research Station. Attendance 50.
• Reighard, G.L. 2018. Peach tree survival and fruit yield on 17 Prunus species rootstocks in South Carolina. Southeastern Professional Fruit Workers Conference, McMinnville, TN. October.
• Reighard G.L. 2018. Strategies for producing temperate tree fruit under increasing winter temperatures. 30th International Horticultural Congress. Istanbul, Turkey.

• Reighard G.L. 2018. Avancos no manejo de PTSL associado a Mesocriconema xenoplax em pesssegueiro. 35th Congresso Brasileiro de nematologia. Bento Gonsalves, Brazil.

• Schupp, J. 2018. Trials and tribulations of 2017 chemical thinning. Mid Atlantic Fruit and Vegetable Conference, Hershey, PA.


• Schupp, J., E. Winzeler and M. Schupp. 2018. Preliminary apple thinning results. Plant Protection Field Day. PSU Fruit Research and Extension Center, Biglerville, PA.

• Schupp, J., H. E. Winzeler and M. Schupp. 2018. Effect of Single or Split Applications of Prohexadione, With and Without Gibberellin 4+7 on Scarf Skin of Buckeye Gala. Cumberland-Shenandoah Fruit Workers Conference, Winchester, VA.

• Schupp, J., E. Winzeler, M. Schupp, and L. Kime. 2018. Pruning by the numbers. Adams County Fruit School, Biglerville, PA.

• Shengrui, Y., 2018. Fruit pruning demonstration (with 2015 organic apple rootstock trial included).

• Shengrui, Y., 2018. Fruit production tour during NMSU Alcalde Field Day with organic apple rootstock trial.


**Fund Leveraging, specifically, collaborative grants between stations and members.**

• Autio, W, R Marini, J Cline, I Minas, G Lang, and T Einhorn. 2018. NC-140 Rootstock Research Trial Coordinators. International Fruit Tree Association. $12,000.

• Beckman, T.G. (Co-PI), D.J. Chavez and J. Cook, J. 2018. Establishment of a prototype nursery at the middle Georgia latitude to demonstrate the feasibility of commercial
propagation of peach on semi-dwarf rootstocks in a one year growing cycle. USDA Innovation Fund. $25,000.

- Bradshaw, T. 2017-2020. Rootstock and tree training systems for unique apple production systems. Vermont Agriculture Experiment Station Hatch Grants Program. $64,084.


- Chavez, D.J. 2018. Irrigation and fertilization management in Georgia. GA Commodity Commission for Peaches. Funding: $11,137.00


- Cline, J. 2017. Canadian Horticultural Council. $25,000


- Crassweller, R. M. and D. E. Smith. 2018. Third generation apple system trials from SHAP Research Committee. $9,000

- Crassweller, R. M., J. R. Schupp, D. Choi, and L. He. 2018. Small equipment grant from PSU College of Agricultural Sciences Research & Graduate Education office. $5,600


- Fallahi, E. 2018. Labor and equipment (in-kind) from Idaho fruit industry. Received approximately $8,000.

- Fallahi, E. Our program has been a member of a team of NC140 scientists who secured considerable funding from SCRI. Our share has been about $160,000 over five years.


- Hao Xu. 2018. Apple rootstock evaluation in British Columbia conditions. Costs of supporting the 2010 NC-140 apple rootstock trial were covered by the start-up funding for new scientists, provided by Agriculture and Agri-Food Canada.

- Hao Xu. 2018. Cherry rootstock and training system evaluation in British Columbia
conditions. Costs of supporting the 2010 NC-140 cherry trial were covered by Agriculture and Agri-Food Canada’s Agri-Science Project, jointly funded by AAFC and the BC Fruit Growers’ Association.

- Ingram, D.L and T.A. Woods. Kentucky Horticulture Infrastructure Development. Kentucky Horticulture Council Grant from Kentucky Agricultural Development Fund funding. (Collaborating faculty: W. Dunwell, Shawn Wright and J. Strang). About $4,000 from this grant were used to cover cost of labor for maintenance and harvest of NC-140 rootstock trials.

- Ivey, M.L, (Plant Pathology), H. Zhu (USDA-ARS Agricultural Engineering), D. Miller (Horticulture and Crop Science) and E. Long (Entomology). 2018. Tall spindle high density apple orchard for rootstock, variety and disease evaluations. OARDC/OSU. $7400 support from and $2000 supplies donation from Ohio Fruit Growers Marketing Association

- Jayanty, S. S., Minas, I., Bartolo, M. E., Grant, 2016-2018. Postharvest handling strategies for Colorado specialty crops to increase marketability and improve consumer quality. Agricultural Experiment Station, Colorado State University, $26,065.00.

- Kon, T.M. 2018. Private industry support. $22,085.68

- Minas, I. 2016 - Establishment of a Tree Fruit Physiology and Quality Program at Western Colorado. Western Colorado Horticultural Society, $10,000.00.


- Parker, M.L. NC Legislature/Special Bill funding for apple research. $6,000.


- Reighard, G. 2018. Screening peach rootstocks for adaptability, productivity, and tolerance to Armillaria and bacterial canker. South Carolina Peach Council research grant. $4,000.

- Reighard, G., K. Gasic, C. Sasaki, et al. 2017-2021. Short and long-term solutions for Armillaria Root Rot in Prunus.” USDA Multi-State Specialty Crops Block Grant with the Pennsylvania Dept. of Ag. $927,000


Stasiak, M. 2018. Door County, WI extension support funding for commercial cherry and apple rootstock fruit research and outreach. $2,500.

Stasiak, M. Wisconsin Cherry Board funding for maintenance of the 2017 NC140 Tart Cherry High Density Rootstock and Irrigation Trials. $2,000.


Wolfe, D. Bayer Corporation donation for the NC-140 rootstock trials. $500.

Villani, S.M. and T.M. Kon. 2017-2018. Defining rapid apple decline: gaining insight into the relationship between abiotic stressors and disease-driven death of apple trees in high-density systems. CALS NC Agricultural Foundation Grant; North Carolina State University. Funding: $24,800.00

Villanueva, R. Bessin, J. Obrychi, and W. Dunwell. 2017-2018. Studies on Ambrosia Beetles Affecting Nursery Crops and Fruit Trees in Kentucky. Kentucky Specialty Crop Block Grant Program. About $500 from this grant were used to cover the cost of labor for maintenance and harvest of NC-140 rootstock trials.

Warmund, M.R. Fruit research. Private gifts from Missouri producers. $2500.
