Multistate Research Project NC-140 Awarded for Improving Sustainability in Orchard Production through Changes in Rootstock Use

Multistate Research Project NC-140 has received the 2015 Excellence in Multistate Research Award from the Experiment Station Committee on Organization and Policy for "Improving Sustainability in Fruit Tree Production through Changes in Rootstock Use." At the University of Massachusetts Amherst, Wes Autio of the Stockbridge School of Agriculture leads NC-140 orchard research trials at the UMass Cold Spring Orchard in Belchertown. At Rutgers University, Win Cowgill of the New Jersey Agricultural Experiment Station leads NC-140 orchard research trials at Rutgers Snyder Farm in Pittstown. More than 30 other US states, three Canadian provinces, and a Mexican state similarly participate in NC-140.

Tree fruit producers suffer losses, seek rootstocks for higher density orchards. In North America, fruit tree producers continue to suffer losses due to cold temperatures, diseases, poor soil conditions, and graft incompatibility. With a highly competitive international market, increased costs of production, consumer demand for high quality fruit, and strong pressure to reduce chemical use, growers are seeking economically and environmentally sustainable orchard production schemes that include improved yields and management efficiency.

Multistate research project NC-140 coordinates research on sustainable rootstocks. To address this need, Multistate Research Project NC-140 forged a viable international partnership between universities and the tree fruit community. Together, they leveraged federal and state dollars to conduct innovative research on fruit tree rootstock genetics, production, management, and economics. NC-140 has evaluated rootstocks of temperate-zone fruit trees from around the world in replicated trials, regularly measuring tree growth, root anchorage, size control, soil and climatic adaptability, and pest and disease resistance. Based on their experimental results, the group used state-of-the-art genomic tools and breeding programs to develop improved rootstocks for temperate-zone fruit trees.

Multistate research project NC-140 provides rootstock for higher-yielding, easier to manage, more sustainable orchards. Major shifts in orchard

On behalf of the NC-140 Technical Committee, Win Cowgill and Ron Perry (Michigan State University and administrative adviosr for NC-140) accept the Award for Excellence in Multistate Research at the annual meeting the Association of Public Land-grant Universities in Indianapolis, Indiana.

architecture in every U.S. state where temperate fruit trees are grown (along with Canada and Mexico) can be attributed to the collaborative efforts of NC-140 researchers, Extension educators, and industry partners. NC-140 recommendations have resulted in earlier returns, greater yields, and higher fruit quality, with a financial benefit to U.S. fruit tree producers of at least $250,000,000. Less easily measured benefits, such as averted losses and enhanced environmental quality, likely increase the financial value of NC-140 to well beyond $500,000,000 over the next five years. For example, adoption of NC-140 recommended dwarfing rootstocks will result in a 50% reduction in canopy volume and a concomitant 50% reduction in pesticide usage on 200,000 acres with net environmental benefits and saving of $150,000,000 in pesticide application costs.

NC-140 rootstock trials contribute to the sustainability of Northeastern tree-fruit growers. At Rutgers University, Professor Win Cowgill and Research Associate Rebecca Magron conduct extensive apple and peach rootstock research at Rutgers Snyder Farm. At the University of Massachusetts Amherst, Professors Wesley Autio and Daniel Cooley of the Stockbridge School of Agriculture, and Extension Educator Jon Clements of the Center for Agriculture, Food, and the Environment are participants in NC-140 apple and peach research conducted at the UMass Cold Spring Orchard in Belchertown. Research results from both states are disseminated through numerous talks, *Fruit Notes* (http://umassfruitnotes.com), *New Jersey Horticultural News* (http://www.horticulturalnews.org/), and many industry and scientific publications.

Throughout the Northeast, nearly all new commercial apple blocks have been planted to trees on size-controlling rootstocks. On this acreage, pruning and harvest labor has declined by 50%, fruit quality and size have increased by 20%, and profit has increased by 50%. In addition, chemical and pesticide cost and application is down by nearly 40% among apple orchards using dwarf rootstocks, and reduced tree canopy volume has led to a 70% decline in pesticide use in those orchards. Apple and peach grower Al Rose of Red Apple Farm in Phillipston, MA and President of the Massachusetts Fruit Growers' Association says "Orchardists of Massachusetts have benefited for nearly 40 years from NC-140 output. When NC-140 suggests that a rootstock performs well, we know as farmers that it will perform well." Fruit grower Ken Wightman, of Wightman Farms in Morristown, New Jersey and past president of the New Jersey State Horticultural Society, says, "I am in the process of replacing every apple tree in my orchard with dwarf trees planted in a tall spindle system based on the guidance provided by NC-140 work in New Jersey."

For more information visit the NC-140 website http://www.nc140.org.

Wes Autio, Ron Perry, Win Cowgill, and Jon Clements relaxing on the Putah Creek the Sunday before the 2015 NC-140 meeting in Davis, California.

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