

The Christmas Tree Promotion Board provides a steady stream of research funds for Christmas tree related projects around the country. Research funds are allocated on a year to year basis to projects that strive to improve the Christmas tree industry both in the long and short term. These projects are national or regional in scope and include one or multiple tree species.

The first research project that is being funded by the Christmas Tree Promotion Board is a continuation of the CoFirGE (Cooperative Fir Germplasm Evaluation project). – Turkish, Trojan Fir (2 year - \$80,000 total funding). This is a national project that is long term in nature.

European fir species are emerging nationally as new and popular alternatives to traditional regional species due to their disease and insect resistance, acceptance in the marketplace and growth habits. The CoFirGE project is one of the most extensive research initiatives ever to be done in the US with a Christmas tree species - over 30,000 trees are being evaluated on sites in Pennsylvania, North Carolina, Connecticut, Michigan, New York, Oregon, Washington and Denmark. Each of the replicated plantings includes progeny from 60 Turkish fir (3 provenances) and 40 Trojan fir (2 provenances) trees and seedlings from proven Christmas tree sources of Balsam, Fraser, Grand, Korean, Noble, Nordmann (3 provenances and 2 Danish seed orchards) and White fir.

Over the life of study, numerous traits are being evaluated such as: growth rate, growth habit, bud development/terminal bud abortion/ bud break timing, needle retention, and tree quality/grade/potential profitability. The goal of this project is to collect scion material from superior Christmas tree families and to establish grafted clonal seed orchards in different regions of the country. Seed from these orchards will provide farmers with an additional species that will grow with reduced inputs, on sites unsuitable for traditional Christmas tree species, which can be offered to our customers at a premium.

Cooperators include: Gary Chastagner – WSU; Chal Landgren – OSU; Rick Bates – PSU
Rich Cowles – CT Ag Exp Station; Bert Clegg – MSU; John Frampton - NCSU

An additional project that has a funding allocation from the Christmas Tree Promotion Board is “Development of IPM Strategies for Management of Slugs on Christmas Trees” (2 year - \$80,000 total funding). This project is a regional, immediate concern project and is short term in nature.

Slugs are one of the most important pests of Christmas trees grown in the Pacific Northwest relative to load rejections in Mexico, Japan, Hawaii and other Pacific Rim destinations. Current strategies for managing slugs focus on a combination of chemical (metaldehyde) and cultural (shaking) measures. However, even with these approaches slugs continue to pose a significant economic problem for Christmas tree growers in Oregon and Washington. In order to develop effective tools for controlling these pests it is critical to know what species are infesting the target crop. Surprisingly this information is currently lacking for slugs in Christmas trees thereby

making it very difficult to design effective approaches for their management. The goal of this project was to determine the community composition of slugs in Douglas fir plantations throughout Oregon and Washington. To date four slug species have been identified including the invasive *Deroceras reticulatum* (Gray field slug), *Arion intermedius* (Hedgehog slug), *Arion subfuscus* (Dusky slug) and the native *Prophysaon andersoni* (Taildropper slug). All of these species except *P. andersoni* were also collected in shipping yards. The goal is to sample in plantations for 12 months in order to determine the seasonal abundance of pest species and in year two, use this information to develop effective tools for both pre and post-harvest management with the ultimate goal of minimizing slug contamination of exported trees. (McDonnell)

Cooperators include: Rory McDonnell OSU; Chal Landgren OSU; and Gary Chastagner WSU

Two other research projects being funded by the Christmas Tree Promotion Board tackle the extremely costly issue of cone removal. These projects strive to reduce production costs, reduce time to market and increase tree value.

The first of these projects “Cultural Options for Reducing Coning of Fir Christmas Trees NCSU” (1 year - \$15,903) is focused on herbicide application techniques to remove emerging cones. Recent research in NC has identified herbicides with the potential to selectively kill cones without damaging the rest of the tree. Three products appear to be especially promising: two organic herbicides and a sucker control product that is also labeled as an herbicide. An application study will be conducted using backpack, hydraulic and mistblower sprayers to identify optimum equipment and application techniques. Different calibrated nozzle treatments will be evaluated for the hydraulic sprayer to identify the most cost effective approach. Sprayer application will also be evaluated for drift and determination of necessary Personal Protective Equipment (PPE). An effort will be made to coordinate study efforts with research conducted through Michigan State University.

Cooperators include: Jeff Owen NCSU and Travis Birdsell NCSU.

The other coning projects “Cultural Options for Reducing Coning of Fraser fir Christmas Trees Michigan” (1 year \$22,087) focuses on two approaches; pro-active cone control (is it possible to keep the trees from coning) and re-active cone control (post-emergent treatment).

This project continues to evaluate coning and growth responses of Fraser fir trees treated with a plant growth regulator (paclobutrazol) in four on-farm trials around Michigan. It also initiates a new round of trials to further evaluate the utility of applying herbicides to developing Fraser fir cones to prevent cone development. This research project revealed an added bonus: Plant growth regulators (PGR) treatments reduced shoot growth and increased bud density in Fraser fir.

Cooperators include: Bert Cregg MSU, Dana Ellison MSU, & Jill O'Donnell MSU

Another immediate needs research project being funded by the Christmas Tree Promotion Board is “Determining the Impact of Elongate Hemlock Scale on Shipped Christmas Trees into Florida” (2 year - \$40,000 total)

Elongate hemlock scale (EHS), *Fiorinia externa*, is an introduced pest from Asia that infests hemlocks and firs (including Douglas fir). This pest has been a leading cause of load rejections of cut Christmas trees from NC into Florida. In 2012, the Florida Department of Agriculture and Consumer Services (FDACS-DPI) reported EHS entering Florida on cut Fraser fir. Incidence reports continued to increase through 2016. In 2017, the FDACS-DPI requested a robust host study of trees in the families *Cupressaceae*, *Pinaceae*, and *Taxaceae* to alleviate regulatory and environmental concerns associated with EHS being shipped into Florida where it is not established. This study strives to determine the susceptibility of important Florida conifer species as potential hosts of EHS.

Cooperators include: Jill Sidebottom NCSU, Travis Birdsell NCSU & Adam Dale UFL

The Christmas Tree Promotion Board is also providing educational materials regarding fire safety and prevention at the National Fire Prevention Association (NFPA) Trade Show. Keeping the lines of communication between Fire Marshalls from across the country and the Christmas tree industry is extremely important to every grower in the nation. As stated on the NFPA 2018 prospectus “Your participation as an exhibitor can influence how your company and products are perceived in the marketplace.” (\$5,000 per year)

As Christmas tree growers, we all must understand that education and research are the cornerstones of our industry. It is important that we continue to search for ways to increase our productivity, reduce our costs, and continue be good stewards of the environment. The forecasted Christmas Tree Promotion Board research budget for the 2018/2019 fiscal year is \$200,000. Future research proposals include: Canaan Fir Improvement; Spotted Lantern Fly Quarantine Issues; *Passalora* Leyland Needle Blight; Nordmann fir Progeny testing; Post Harvest Needle Retention; New Technology-Drones; *Megastigmus* Quarantine (seed insect); and Web Blight.

How can you help? In order to have the most impact we need to know what's important to you! Do you have a research idea? A problem or solution that needs further study? Please contact the CTPB Research Committee.

Della Deal,
CTPB Research Committee Chairperson