2018 Summary of Accomplishments

Developing sterile forms of economically important nursery crops

This update is provided to the OAN Research Committee and ODA to highlight areas of ongoing progress in research projects to breed new trees and shrubs with reduced fertility to support the Oregon Nursery Industry.

MAPLES. To date we have triploids of Norway, Amur, and trident maples. This year we developed 24 tetraploids of hedge maple that will be planted in spring or fall 2019. Our program, to my knowledge, is the world's leading developer of triploid maples. I have seen no other information in the literature on the subject and in discussions with colleagues, Dr. Tom Ranney is the only other breeder also seriously pursuing this path of sterility. His collaborative efforts with J. Frank Schmidt and Sons Nursery are moving forward, primarily on *Acer ginnala* at this time and while there is overlap, we have taken a different approach. This year I completed the "data" portion of this work in which I have determined the rate of triploid development from tetraploids interplanted with diploids. We shifted to a "breeding mode" with the seed collected in 2018. Instead of collecting seeds, stratifying, and germinating in the greenhouse to then evaluate each individual plant for ploidy level, we direct sowed seeds in field beds. In this way, we reduced labor dramatically and will move to selecting trees on their merits first and then identifying if they are triploids. However, this shift only took place because we were able to demonstrate that >90% of plants derived from tetraploids were triploid.

Table 1. Number of seed collected from tetraploid maples during 2018. Based on 2016 & 2017 data, we expect >90% of germinated seedlings will be triploid

Taxon	**Location**	**Number seed**
Acer buergerianum	72.18	44
Acer ginnala	75.15	486
Acer ginnala	74.22	2541
Acer ginnala	75.11	261
Acer ginnala	75.12	45
Acer platanoides	71.16	102
Acer platanoides	V01.34	65
Acer platanoides	V01.45	50
TOTAL		**3594**

Additionally, we have confirmed that our fields are infested with *Verticillium* wilt. While this sounds tragic, we are using it as a selection tool. We are identifying genotypes that are resistant. It remains unclear what the path forward with these due to propagation methods (budding vs. rooted cuttings) but we are working to optimize cutting propagation in hopes that it will support adoption of own-rooted clones that are resistant to Vert.

Fig. 1. Susceptible *Acer ginnala* removed that was suffering from Vert wilt. Remaining genotypes have been symptom free, thus we think will be good sources of resistance moving forward.

***CHERRYLAUREL*.** There were few major developments with cherrylaurel this year. We had many of the 33x, 44x, and mixoploid plants flower this year. I had a student researcher evaluate the pollen diameter and relative viability. There is some reduction in fertility but I expect that we are not at a sufficient level for introduction. We are waiting for Portuguese cherrylaurels to flower to resume hybridization attempts. In 2018, we planted a large population of 22x, 33x, 44x, cherrylaurels and 8x & 16x Portuguese cherrylaurels. These will remain in place for an extended period of observation and controlled crossing when they flower.

***ROSE-OF-SHARON or ALTHEA*.** We have made excellent progress on althea this year. We have identified approximately 15 selections that are virtually seedless and have excellent ornamental traits that we have replicate clones of. We have been selecting for larger flowers, depth of color, and green foliage. The latter trait is something that I believe will be a huge advantage for our growers, as many common cultivars suffer from an undiagnosed chlorosis thought to be related to lack of heat in our region (though it is not limited to us). These clonal selections will be distributed for testing with nurseries in 2019. There has already been great interest among visiting companies upon seeing our selections.