

Molecular, Physiological, and Ecological Evaluation of Latvian Genetic Resources of Valuable Wild Legume Species *Trifolium fragiferum* in the Context of Sustainable Agriculture

Garbarino , Magnolia (School: Pawling High School)

Trifolium fragiferum (strawberry clover) is a wild legume species found rarely in Northern European seaside areas and is genetically close to domesticated clover species. Seven micro-populations of *T. fragiferum* have been identified in Latvia, along the coasts of the Baltic Sea and Bay of Riga. The goal of this study is to evaluate the tolerance of identified Latvian *T. fragiferum* accessions to abiotic stress, as well as to determine their genetic diversity. Two Northern European genotypes (TF1 from Latvia and TF9 from Denmark) of *T. fragiferum* were grown in controlled settings with varying soil sodium levels (0-5 g/L) in order to quantify the physiological and morphological effect of salinity on the samples. Further, the soil conditions of wild Latvian *T. fragiferum* accessions' environments were evaluated for all eight identified genotypes (one of the seven micro-populations was split into two genotypes). In controlled conditions, most photosynthetic and morphological parameters of TF1 experienced a smaller relative effect as a result of elevated sodium when compared with TF9. Sodium was found to have a significant positive correlation with photosynthetic parameters, and a significant negative correlation with biomass for both TF1 and TF9. The results of the field study show genetic and morphological diversity between the identified accessions. These findings allow for a comprehensive understanding of the physiology, stress tolerance, and genetic diversity of Latvian accessions of strawberry clover, which will help determine its viability as a genetic resource for other clover species and for use in a variety of sustainable agricultural settings.

Awards Won:

