

Research Priorities for TCD

- Mapping the distribution of the host
- Identify risk factors and high-risk pathways
- Effective monitoring

Mapping the distribution of the host

- Why do we need to know the distribution of black walnut?
 - A first step for effective TCD monitoring
 - A base for identify potential TCD pathway
 - Slow the spread of TCD by strategically treat certain areas that can serve as TCD hotspots
 - A base for effective regional TCD management and control

Mapping the distribution of the host

- What do we know about black walnut distribution?
 - Limited spatial distribution in natural forest
 - Many plantations across the region
 - No existing maps available for walnut either at the local or regional level

Mapping the distribution of the host

- Is it feasible to map walnut distribution?
 - Distribution in natural forest can be modeled based on FIA data and associated physiographic factors (e.g., soil type, topography, moisture etc.) using species distribution models
 - Distribution of planted sites can be estimated by georeferencing national walnut council registered database
 - Distribution of sparse urban walnut trees will be challenging, but potentially can be done via remote sensing use the species special phenology

Identify risk factors and high-risk pathways

- Understand vectors for TCD spread (nursery stock, transportation related?)
- Identify potential TCD dispersal pathways

Effective TCD monitoring

- Why new monitoring strategy?
 - Incursion will usually follow multiple pathways,
 - Modern landscapes are complex with heterogeneity in land use and land cover types, densities, and arrangements
 - Based on variability in the likelihood of occurrence
 - Enhance survey efficiency and effectiveness

Effective TCD monitoring

- Feasibility of new monitoring strategy
 - Many models available to design monitoring method.
 - In particular, Circuit theory and Gravity models have provide useful predictions to guide effective monitoring