

Impervious surface thresholds and a technique to guide urban red maple planting

Adam Dale¹, Elsa Youngsteadt², and Steve Frank²
¹University of Florida, ²North Carolina State University

Significance:

- Urban trees provide services that benefit humans and the environment
- Insect pests are often more abundant and damaging on urban than rural trees
- Pest damage and urban stress reduce tree health and longevity and increase maintenance costs

Evidence:

- Impervious surfaces (roads, parking lots, and buildings) increase air temperature and drought stress
- Heat and drought increase tree stress and scale insect abundance
- Pests and stress from impervious surfaces reduce tree condition

Take Home: **Amount of impervious surface predicts pest abundance and tree condition**

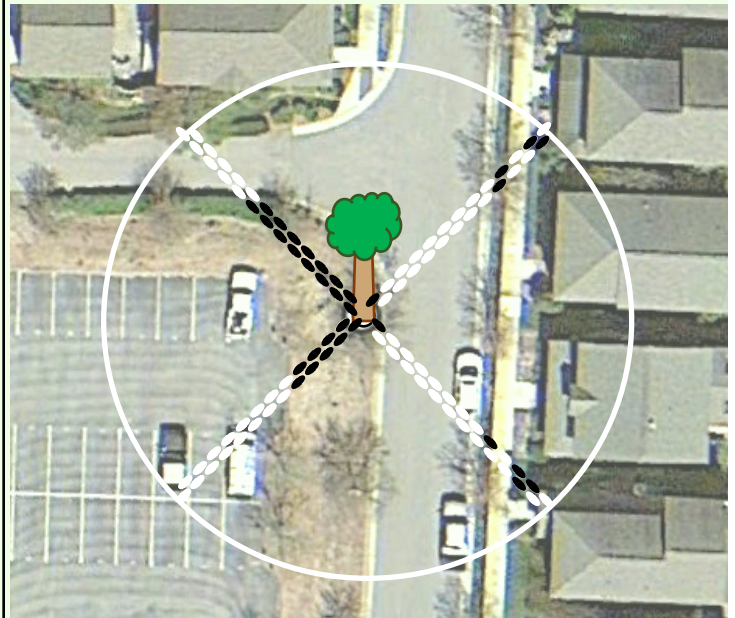
Impervious Surface Thresholds

The percentage of ground around a planting site that is impervious to water

- 0-32% impervious: Suitable red maple planting site
- 32-62% impervious: Consider other tree species
- 62-100% impervious: Do not plant red maple

The 'Pace to Plant' Technique

- Method for estimating impervious surface cover around a planting site
- From the planting site, take 25 steps at 45° to the nearest impervious edge
- Count the number of steps that land on impervious surface
- Do this in 4 directions, making an X through the planting site
- The total number of (white) steps that land on impervious surface is equal to the percent of impervious surface around the planting site



Dale AG, Youngsteadt E, Frank SD. 2016. Forecasting the effects of heat and pests on urban trees: Impervious surface thresholds and the 'Pace to Plant' technique. *Arboriculture & Urban Forestry* 42(3) 181-191.