

CONIFER ESTABLISHMENT IN SEATTLE PARKS

Recent efforts to replant forested public lands in Seattle as part of The Green Seattle Partnership (GSP) have seen varying success, with some sites experiencing 80% seedling mortality after one year. With several thousand conifers seedlings installed each year as part of GSP it is critical that survivorship improves.



Western Hemlock March 2008



Western Hemlock Oct 2008

FIELD EXPERIMENT:

Research was conducted at two Seattle Parks to better understand the efficacy of common plant establishment methods in the context of Seattle urban forest restoration.

Drip irrigation, DriWater gel packs, and mulch rings were tested alone and in combination for three conifer species: Western Hemlock, Western Red Cedar, and Grand Fir.



TREATMENTS:

Mulch:

Potential to increase soil's organic content, decrease moisture evaporation, and increase tree growth. Limited research exists for application in urban forests.



DriWater:

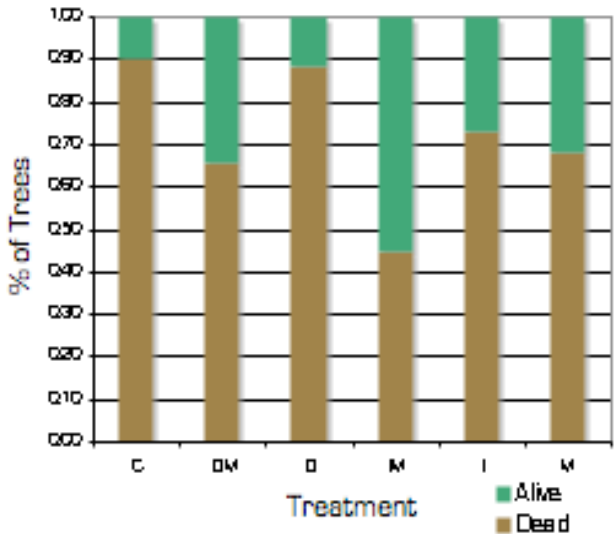
Gel product made primarily of water that releases when degraded by soil organisms. Little info exists on its effectiveness in a restoration context.



Drip Irrigation:

Although complicated in a forest setting, irrigation may reduce water stress and increase tree growth.

Interlaken Western Hemlock Mortality



MORTALITY:

Interlaken Park experienced much higher mortality than the West Duwamish experiment site where all treatments saw a 95% survival rate, suggesting that no mulch or water additions were necessary.

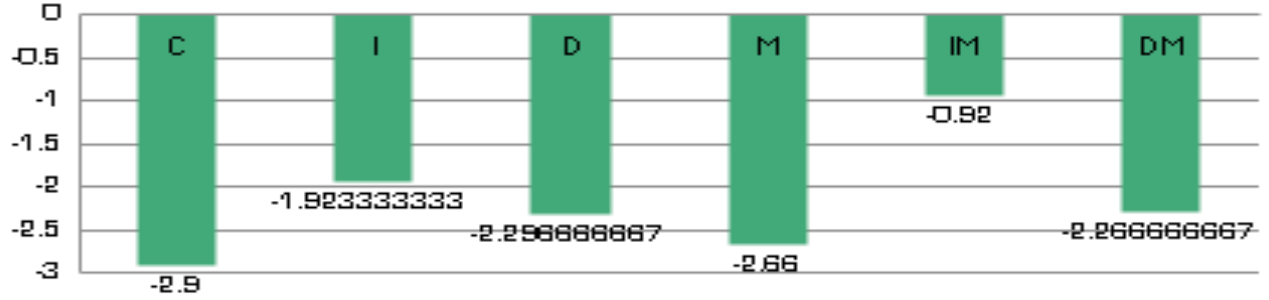
The graph to the left suggests that irrigation and mulch increased Western Hemlock survival after one summer to 55% at Interlaken Park. Although still low, this could be a sufficient goal for future restoration projects.

WATER STRESS:

Water stress was measured during late July 2008 at both parks using a Scholander Pressure Chamber. Results correspond with mortality and illustrate the impact of summer drought conditions.

- 0.5 - 1.0 Growth not limited by water, maintains maximum shoot growth.
- 1.0 - 1.2 Slight to moderate shoot growth reductions. Stress limits phloem transport, leaf expansion, and diameter growth.
- 1.2 - 1.4 Stomata close, shoot growth stops. Growth rate declining.

Water Stress
Interlaken Park Western Hemlock



Soil Characteristics	Interlaken	West Duwamish
% organic matter	6.43	6.93
CEC	8.15	20.5
Texture	Loamy Sand	Clay Loam

SOIL:

Soil characteristics have played a key role in conifer survivorship at each site. The loamy sand texture at Interlaken impacts the the soil's ability to hold water and nutrients. Texture may be a good indicator of the necessity of mulch, irrigation, and DriWater.

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