Project Profile

WL 03

R&D PROJECT - Dry
IDF DK1

Project Overview

Flash Forest partnered with a private landowner on a research and development planting operation in a dry, hot Interior Douglas-fir BEC zone near Kamloops. The site was the driest and hottest of any project planted. No client was charged for this site, as it was selected to test the limits of our pod's water retention capabilities in arid forests dominated by Ponderosa Pine.

Site Details

Species: Douglas-fir, Ponderosa Pine, Lodgepole pine, Western larch
Size: 5 Hectares
Target Seedlings: 7,000
Burn Age: 2021
Planted: May, 2022
Biogeoclimatic Zone: Dry Hot Interior Douglas Fir Zone
Land Preparation: None

Flagged Transect Summary (Permanent Plot)

In the first year, seven plots of flagged rows were distributed across WL03 with pods planted directly adjacent to flags. These permanent plots allowed us to assess early germination rates in our hottest and driest region, as well as test the performance of embedded vs dropped pods and the relative success of four different species. We used a sampling density of roughly 1 plot / 1 hectare for this site.

Permanent (flagged) plot distribution across the block.

Flagged pod rows on the dry, sandy seedbed.

Circular Plot Summary (Temporary Plot)

In the second year, zero circular plots were distributed at this site, due to the design of this as an R&D project and not a commercial plant. This eco-region in British Columbia has proved very challenging for manually planted seedlings, with atypically high mortality rates.

Environmental Factor	Avg Across All Sites	Avg for WL 03
Mean Summer Precipitation (mm)	>250	92
Mean Summer Daily Max Temperature (°C)	18 °C	27 °C

Findings: Permanent Plot Assessments at Year 1 & Year 2

This data summary is distinct from most sites because no circular plots (temporary) were established here. To calculate seedling counts, the team counted seedlings at flagged transects and estimated total seedlings based on those survival rates. For example, if the flagged rows showed 5% of seedlings surviving, we assumed that held true for the rest of the site.

Site	WL 03
Size (ha)	5
Target Seedlings Per Hectare (SPH)	1,400
Target Seedlings per Circular Plot	8
Flag-Transect Assessment	**Seedlings (entire site)**
Summer 2022	5,740
Fall 2022	2,660
Fall 2023	660
Average Stems Per Hectare	**132**

Species Mix (Year 1 permanent plots)	
Douglas Fir	70%
Ponderosa Pine	18%
Western Larch	7%
Lodgepole Pine	5%

Seedling assessed at 2 months

Seedling assessed at 6 months

Takeaways

1. Permanent plots showed low germination rates in the first 3 months.
2. Low elevation, sparse tree canopies, low precipitation, and extremely hot conditions at the site resulted in low germination in the first three months. Notably, the pods that did germinate at this site were some of the largest and fastest growing of any sites planted, likely due to insolation (6 inches in height).
3. Between the mid-summer and late fall assessment in year 1, 54% of early germinants died. Additionally, this was the only site that experienced significant mortality between year 1 and year 2, with a subsequent 75% seedling die-off between fall 2022 and fall 2023.
4. None of these findings were too surprising, as this area has traditionally been very challenging for any tree planting efforts (including nursery-grown seedlings).
5. This site was 150% drier than our standard cut-off for sites (250 mm MSP) and 35% hotter than our standard cut-off for sites.
6. The flag-transect estimates indicated that the site was understocked by the end of year 2.
7. This site was also too dry and hot for commercial operations, and it is recommended that drone planting operations do not occur in this type of ecosystem until further improvements are made to pod technology, or significantly higher seed usage is entertained.